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May 2007

# DOD BUSINESS SYSTEMS MODERNIZATION

## Progress Continues to Be Made in Establishing Corporate Management Controls, but Further Steps Are Needed



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May 2007

## DOD BUSINESS SYSTEMS MODERNIZATION

### Progress Continues to Be Made in Establishing Corporate Management Controls, but Further Steps Are Needed

#### Why GAO Did This Study

In 1995, GAO first designated the Department of Defense's (DOD) business systems modernization program as "high risk," and GAO continues to do so today. To assist in addressing this high-risk area, the Fiscal Year 2005 National Defense Authorization Act contains provisions that are consistent with prior GAO recommendations. Further, the act requires the department to submit annual reports to its congressional committees on its compliance with these provisions and it directs GAO to review each report. In response, GAO assessed DOD's actions to address (1) requirements in the act and (2) GAO's recommendations that it reported as open in its prior annual report under the act. In doing so, GAO reviewed documentation and interviewed officials relative to the act and related guidance.

#### What GAO Recommends

GAO is recommending that future DOD annual reports include an assessment by its independent verification and validation agent of the quality of the department's federated family of architectures, including the associated transition plan(s). In written comments, DOD agreed with GAO's recommendation.

[www.gao.gov/cgi-bin/get rpt?GAO-07-733](http://www.gao.gov/cgi-bin/get rpt?GAO-07-733).

To view the full product, including the scope and methodology, click on the link above. For more information, contact Randolph C. Hite at (202) 512-3439 or [hiter@gao.gov](mailto:hiter@gao.gov).

#### What GAO Found

As part of DOD's recent efforts to strengthen management of its business systems modernization program, it has taken steps over the last year to build on past efforts and further comply with the act's requirements and relevant guidance. However, additional steps are needed. For example,

- The latest version of DOD's business enterprise architecture now contains information about the department's "As Is" corporate environment, which is important for effective transition planning. Further, this version represents a major step in building the family of architectures that are needed to fully satisfy the act and effectively guide and constrain thousands of system investments across all DOD component organizations. Nevertheless, GAO's reports since its last annual report under the act show that the strategy for extending the business enterprise architecture to defense components needs further definition to make it executable and the maturity of key components' architecture programs is limited. GAO has recently made recommendations to address these challenges.
- The updated enterprise transition plan, which is an essential component of an enterprise architecture, continues to identify systems and initiatives that are to fill business capability gaps and address DOD-wide and component business priorities contained in the business enterprise architecture. However, it does not include investments for all components and does not reflect key factors associated with properly sequencing planned investments, such as dependencies among investments and the capability to execute the plan, which GAO's existing recommendations provide for addressing.
- DOD has established and begun implementing the investment review structures and processes that are consistent with the act. However, it has yet to do so in a manner that is consistent with relevant guidance. In particular, it has yet to fully define the related policies and procedures needed to effectively execute both project-level and portfolio-based information technology investment management practices. GAO has recently made recommendations to address these shortcomings.

DOD also continues to make progress in implementing GAO recommendations aimed at strengthening business systems modernization management. In particular, of the 14 open recommendations that GAO identified in its prior annual report under the act, 10 have either been largely implemented or subsumed by the more recent recommendations cited above. For example, DOD has implemented GAO's recommendations aimed at effectively using the assessments that have been performed by DOD's independent verification and validation contractor. Such assessments provide important information for department and congressional oversight bodies to use to better ensure the definition and institutionalization of the corporate management controls that GAO has cited as essential to addressing the DOD business systems modernization high-risk area. The department's annual reports have not included such assessments.

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## Abbreviations

ASD(NII)/CIO	Assistant Secretary of Defense (Networks and Information Integration)/Chief Information Officer
BEA	business enterprise architecture
BEP	business enterprise priority
BTA	Business Transformation Agency
CIO	chief information officer
DBSMC	Defense Business Systems Management Committee
DOD	Department of Defense
ETP	enterprise transition plan
IRB	Investment Review Board
IT	information technology
ITIM	Information Technology Investment Management framework
NCES	Net-Centric Enterprise Services
OMB	Office of Management and Budget
SOA	service-oriented architecture
USD(AT&L)	Under Secretary of Defense (Acquisition, Technology, and Logistics)

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**United States Government Accountability Office  
Washington, DC 20548**

May 14, 2007

**Congressional Committees**

For decades, the Department of Defense (DOD) has been challenged in modernizing its timeworn business systems.<sup>1</sup> In 1995, we designated DOD's business systems modernization program as high risk, and we continue to designate it as such today.<sup>2</sup> As our research on public and private sector organizations shows, two essential ingredients to a successful systems modernization program are having a well-defined enterprise architecture<sup>3</sup> and an effective institutional approach to managing information technology (IT) investments.

Accordingly, we made recommendations to the Secretary of Defense in May 2001 that included the means for effectively developing an enterprise architecture and establishing a corporate approach to investment control and decision making.<sup>4</sup> Between 2001 and 2005, we reported that the department's business systems modernization program continued to lack both of these, concluding in 2005 that hundreds of millions of dollars had been spent on a business enterprise architecture (BEA) and investment

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<sup>1</sup>Business systems support DOD's business operations, such as civilian personnel, finance, health, logistics, military personnel, procurement, and transportation.

<sup>2</sup>GAO, *High-Risk Series: An Update*, GAO-07-310 (Washington, D.C.: January 2007).

<sup>3</sup>An enterprise architecture, or modernization blueprint, provides a clear and comprehensive picture of an entity, whether it is an organization (e.g., federal department or agency) or a functional or mission area that cuts across more than one organization (e.g., financial management). This picture consists of snapshots of the enterprise's current "As Is" operational and technological environment and its target or "To Be" environment, and contains a capital investment road map for transitioning from the current to the target environment. These snapshots consist of "views," which are basically one or more architecture products that provide conceptual or logical representations of the enterprise.

<sup>4</sup>GAO, *Information Technology: Architecture Needed to Guide Modernization of DOD's Financial Operations*, GAO-01-525 (Washington, D.C.: May 17, 2001).

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management structures that had limited use.<sup>5</sup> Accordingly, we made more explicit architecture and investment-related recommendations.

To assist DOD in addressing these modernization management challenges, Congress included provisions in the Ronald W. Reagan National Defense Authorization Act for Fiscal Year 2005<sup>6</sup> that were consistent with our recommendations. More specifically, the act required the department to, among other things, (1) develop a BEA, (2) develop a transition plan to implement the architecture, (3) include systems information in its annual budget submission, (4) establish a system investment approval and accountability structure, (5) establish an investment review process, and (6) approve and certify any system modernizations costing in excess of \$1 million. The act further requires that the Secretary of Defense submit an annual report to congressional defense committees on DOD's compliance with certain requirements of the act not later than March 15 of each year from 2005 through 2009. Additionally, the act directs us to submit—within 60 days of DOD's report submission—to congressional defense committees an assessment of the actions taken to comply with these requirements.

As agreed with your offices, the objectives of our review were to (1) assess the actions taken by DOD to comply with requirements of section 2222 of

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<sup>5</sup>See, for example, GAO, *Defense Business Transformation: A Comprehensive Plan, Integrated Efforts, and Sustained Leadership Are Needed to Assure Success*, GAO-07-229T (Washington, D.C.: Nov. 16, 2006); *Business Systems Modernization: DOD Continues to Improve Institutional Approach, but Further Steps Needed*, GAO-06-658 (Washington, D.C.: May 15, 2006); *DOD Business Systems Modernization: Long-standing Weaknesses in Enterprise Architecture Development Need to Be Addressed*, GAO-05-702 (Washington, D.C.: July 22, 2005); *DOD Business Systems Modernization: Billions Being Invested without Adequate Oversight*, GAO-05-381 (Washington, D.C.: Apr. 29, 2005); *DOD Business Systems Modernization: Limited Progress in Development of Business Enterprise Architecture and Oversight of Information Technology Investments*, GAO-04-731R (Washington, D.C.: May 17, 2004); *DOD Business Systems Modernization: Important Progress Made to Develop Business Enterprise Architecture, but Much Work Remains*, GAO-03-1018 (Washington, D.C.: Sept. 19, 2003); *Business Systems Modernization: Summary of GAO's Assessment of the Department of Defense's Initial Business Enterprise Architecture*, GAO-03-877R (Washington, D.C.: July 7, 2003); *Information Technology: Observations on Department of Defense's Draft Enterprise Architecture*, GAO-03-571R (Washington, D.C.: Mar. 28, 2003); *DOD Business Systems Modernization: Improvements to Enterprise Architecture Development and Implementation Efforts Needed*, GAO-03-458 (Washington, D.C.: Feb. 28, 2003); and GAO-01-525.

<sup>6</sup>Ronald W. Reagan National Defense Authorization Act for Fiscal Year 2005, Pub. L. No. 108-375, § 332, 118 Stat. 1811, 1851-1856 (Oct. 28, 2004) (codified in part at 10 U.S.C. § 2222).

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Title 10, U.S. Code, and (2) determine the extent DOD has addressed our prior open recommendations for institutionalizing key business system modernization management controls. To accomplish this, we used our prior annual report under the act<sup>7</sup> as a baseline, analyzing whether the department had taken actions to comply with those provisions of the act, related guidance, and the prior recommendations that we had identified in our prior annual report as not yet addressed. In doing this, we also relied on the results of relevant reports that we have issued since our prior annual report.<sup>8</sup> We performed our work at DOD headquarters in Arlington, Virginia, from March through May 2007 in accordance with generally accepted government auditing standards. Details on our objectives, scope, and methodology are contained in appendix I.

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## Results in Brief

DOD continues to take steps to comply with legislative requirements and related guidance pertaining to its business systems modernization high risk area. In particular, on March 15, 2007, DOD released a new version of its BEA, developed an updated enterprise transition plan, and issued its annual report to Congress describing steps taken and planned relative to the act's requirements, among other things. The steps address several of the missing elements that we previously identified relative to the legislative provisions and related best practices concerning the BEA, enterprise transition plan, budgetary disclosure, investment management, and reviews of systems costing in excess of \$1 million. However, additional steps are needed to fully comply with the act and relevant guidance. For example:

- The latest version of the BEA now contains information about the department's "As Is" corporate environment for some enterprise priority areas (e.g., Financial Visibility), which is important to support the business capability gap analyses needed for transition planning; however, it does not do this for all priority areas (e.g., Acquisition Visibility). Moreover, while the latest version's focus on DOD-wide, corporate policies, capabilities, rules, and standards is an essential element to meeting the act's requirements, this version has yet to be augmented by the DOD

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<sup>7</sup>GAO-06-658.

<sup>8</sup>GAO, *Business Systems Modernization: DOD Needs to Fully Define Policies and Procedures for Institutionally Managing Investments*, GAO-07-538 (Washington, D.C.: May 11, 2007); and *Business Systems Modernization: Strategy for Evolving DOD's Business Enterprise Architecture Offers Conceptual Approach but Execution Details Needed*, GAO-07-451 (Washington, D.C.: Apr. 16, 2007).

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component organizations' subsidiary architectures that are also essential to meeting the act's requirements and the department's goal of having a federated family of architectures. Compounding this are our recent reports showing the military departments' architecture programs are not mature and the strategy that the department has developed for federating its BEA needs more definition to be executable.<sup>9</sup> To address these limitations, our recent reports contain additional recommendations. Once these limitations are addressed, the architecture should provide a more sufficient frame of reference to optimally guide and constrain DOD-wide system investments.

- The updated transition plan continues to identify more systems and initiatives that are to fill business capability gaps and address DOD-wide and component business priorities and continues to provide a range of information for each system and initiative in the plan (e.g., budget information, performance metrics, and milestones). Further, the updated plan also identifies legacy systems that will not be part of its target environment. However, this latest transition plan still does not include system investment information for all the defense agencies and combatant commands. Moreover, the plan does not sequence the planned investments based on a range of relevant factors, such as technology opportunities, marketplace trends, institutional system development and acquisition capabilities, legacy and new system dependencies and life expectancies, and the projected value of competing investments. According to DOD officials, they intend to address such limitations in future versions of the transition plan. We have an existing recommendation to the department to formalize its plans for incrementally evolving the transition plan. Once these limitations in the department's transition plan(s) are addressed, it will be better positioned to effectively and efficiently migrate to a more modernized systems environment.
- The department's fiscal year 2008 budget submission provides a range of information on business systems, including types of information cited in the act, such as system name, designated approval authority, and funding to be used for development/modernization versus operations/maintenance.
- While the department has established and begun implementing the investment review structures and processes that are consistent with the act, it has yet to do so in a manner that is consistent with relevant

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<sup>9</sup>GAO-07-451 and *Enterprise Architecture: Leadership Remains Key to Establishing and Leveraging Architectures for Organizational Transformation*, GAO-06-831 (Washington, D.C.: Aug. 14, 2006).

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guidance. As we recently reported,<sup>10</sup> the department has yet to fully define the related policies and procedures needed to effectively execute both project-level and portfolio-based IT investment management practices. For example, DOD had established an enterprise-wide IT investment board responsible for defining and implementing its business system investment governance process, but it had not fully defined the policies and procedures needed for oversight of and visibility into operations and maintenance investments. To address these investment management weaknesses, our recent report contains additional recommendations. Once these policies and procedures are fully defined, the risk of projects and portfolios of projects being inconsistently and improperly selected and controlled will be reduced, thus increasing the chances of investments meeting mission needs in the most cost-effective manner.

- The department continues to review and approve business systems as directed by the act. As of March 2007, the department reported that its highest investment review body had approved 285 systems. However, the military departments' review and approval processes are still evolving, according to Air Force, Army, and Navy officials, and additional work is needed to mature them. Because of the importance of the military departments' investment management structures and processes, we have ongoing work to determine the extent to which the Air Force and the Navy are employing relevant investment management guidance.

In concert with the department's efforts to comply with the act, it has also largely implemented, or our recommendations in recent reports have otherwise subsumed, 10 of the 14 recommendations that we identified as open in our prior annual report under the act. For example, DOD has implemented our recommendation aimed at effectively using the results of the BEA independent verification and validation contractor on prior versions of the architecture. Use of an independent verification and validation agent is an architecture management best practice for identifying architecture strengths and weaknesses and disclosing to department and congressional oversight bodies the information they need to better ensure that DOD's family of architectures and associated transition plan(s) satisfy key quality parameters. According to department officials, they are committed to addressing all of our open recommendations, and have actions under way and plans in place to address the remaining 4.

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<sup>10</sup> GAO-07-538.

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To facilitate congressional oversight and promote departmental accountability, we are recommending that the department include in its future annual reports under the act the results of its independent verification and validation agent's assessment of the extent to which the department's federated family of its corporate and component architectures, including the related transition plan(s), are complete, consistent, understandable, and usable. The department has not included such information in its annual reports. In written comments on a draft of this report, signed by the Deputy Under Secretary of Defense (Business Transformation) and reprinted in appendix IV, the department agreed with our recommendation.

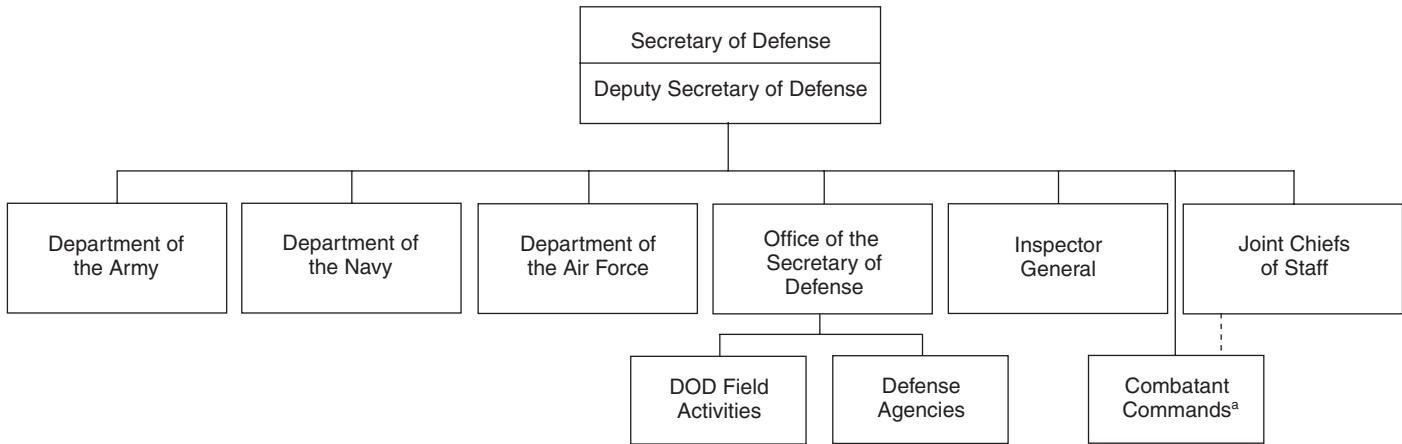
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## Background

DOD is a massive and complex organization. To illustrate, the department reported that its fiscal year 2006 operations involved approximately \$1.4 trillion in assets and \$2.0 trillion in liabilities; more than 2.9 million in military and civilian personnel; and \$581 billion in net cost of operations. To date, for fiscal year 2007, the department received appropriations of about \$501 billion. Organizationally, the department includes the Office of the Secretary of Defense, the Chairman of the Joint Chiefs of Staff, the military departments, numerous defense agencies and field activities; and various unified combatant commands that are either responsible for specific geographic regions or specific functions. (See fig. 1 for a simplified depiction of DOD's organizational structure.)

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**Figure 1: Simplified DOD Organizational Structure**



Source: GAO based on DOD documentation.

<sup>a</sup>The Chairman of the Joint Chiefs of Staff serves as the spokesman for the commanders of the combatant commands, especially on the administrative requirements of the commands.

In support of its military operations, the department performs an assortment of interrelated and interdependent business functions, including logistics management, procurement, health care management, and financial management. As we have previously reported,<sup>11</sup> the DOD systems environment that supports these business functions is overly complex and error prone, and is characterized by (1) little standardization across the department, (2) multiple systems performing the same tasks, (3) the same data stored in multiple systems, and (4) the need for data to be entered manually into multiple systems. Moreover, DOD recently reported that this systems environment is comprised of approximately 3,100 separate business systems. For fiscal year 2007, Congress appropriated approximately \$15.7 billion to DOD, and for fiscal year 2008, DOD has requested about \$15.9 billion in appropriated funds to operate, maintain, and modernize these business systems and associated infrastructure.

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<sup>11</sup> GAO-06-658.

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As we have previously reported,<sup>12</sup> the department's nonintegrated and duplicative systems impair DOD's ability to combat fraud, waste, and abuse. In fact, DOD currently bears responsibility, in whole or in part, for 15 of our 27 high-risk areas.<sup>13</sup> Eight of these areas are specific to DOD<sup>14</sup> and the department shares responsibility for 7 other governmentwide high-risk areas.<sup>15</sup> DOD's business systems modernization is one of the high-risk areas, and it is an essential enabler to addressing many of the department's other high-risk areas. For example, modernized business systems are integral to the department's efforts to address its financial, supply chain, and information security management high-risk areas.

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## Enterprise Architecture and IT Investment Management Controls Are Critical to Achieving Successful Systems Modernization

Effective use of an enterprise architecture—a modernization blueprint—is a hallmark of successful public and private organizations. For more than a decade, we have promoted the use of architectures to guide and constrain systems modernization, recognizing them as a crucial means to this challenging goal: optimally defined operational and technological environments. Congress, the Office of Management and Budget (OMB), and the federal Chief Information Officer's (CIO) Council have also recognized the importance of an architecture-centric approach to modernization. The Clinger-Cohen Act of 1996<sup>16</sup> mandates that an agency's CIO develop, maintain, and facilitate the implementation of an information technology architecture. Further, the E-Government Act of 2002<sup>17</sup> requires OMB to oversee the development of enterprise architectures within and

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<sup>12</sup>See, for example, GAO, *DOD Travel Cards: Control Weaknesses Resulted in Millions of Dollars of Improper Payments*, GAO-04-576 (Washington, D.C.: June 9, 2004); *Military Pay: Army National Guard Personnel Mobilized to Active Duty Experienced Significant Pay Problems*, GAO-04-89 (Washington, D.C.: Nov. 13, 2003); and *Defense Inventory: Opportunities Exist to Improve Spare Parts Support Aboard Deployed Navy Ships*, GAO-03-887 (Washington, D.C.: Aug. 29, 2003).

<sup>13</sup>GAO-07-310.

<sup>14</sup>These 8 high-risk areas include DOD's overall approach to business transformation, business systems modernization, financial management, the personnel security clearance program, supply chain management, support infrastructure management, weapon systems acquisition, and contract management.

<sup>15</sup>The 7 governmentwide high-risk areas are (1) disability programs, (2) ensuring the effective protection of technologies critical to U.S. national security interests, (3) interagency contracting, (4) information systems and critical infrastructure, (5) information-sharing for homeland security, (6) human capital, and (7) real property.

<sup>16</sup>The Clinger-Cohen Act of 1996, 40 U.S.C. § 11315(b)(2).

<sup>17</sup>The E-Government Act of 2002, Pub. L. No. 107-347 (Dec. 17, 2002).

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across agencies. In addition, we, OMB, and the CIO Council have issued guidance that emphasizes the need for system investments to be consistent with these architectures.<sup>18</sup>

A corporate approach to IT investment management is characteristic of successful public and private organizations. Recognizing this, Congress enacted the Clinger-Cohen Act of 1996,<sup>19</sup> which requires OMB to establish processes to analyze, track, and evaluate the risks and results of major capital investments in IT systems made by executive agencies.<sup>20</sup> In response to the Clinger-Cohen Act and other statutes, OMB has developed policy and issued guidance for planning, budgeting, acquisition, and management of federal capital assets.<sup>21</sup> We have also issued guidance in this area,<sup>22</sup> which defines institutional structures, such as Investment Review Boards (IRB), processes for developing information on investments (such as costs and benefits), and practices to inform management decisions (such as whether a given investment is aligned with an enterprise architecture).

## Enterprise Architecture: A Brief Description

An enterprise architecture provides a clear and comprehensive picture of an entity, whether it is an organization (e.g., a federal department) or a functional or mission area that cuts across more than one organization (e.g., financial management). This picture consists of snapshots of both

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<sup>18</sup>GAO, *Information Technology Investment Management: A Framework for Assessing and Improving Process Maturity*, GAO-04-394G (Washington, D.C.: March 2004); OMB, *Capital Programming Guide, Version 1.0* (July 1997); and CIO Council, *A Practical Guide to Federal Enterprise Architecture, Version 1.0* (February 2001).

<sup>19</sup>The Clinger-Cohen Act of 1996, 40 U.S.C. §§ 11101-11704. This act expanded the responsibilities of OMB and the agencies that had been set under the Paperwork Reduction Act with regard to IT management. See 44 U.S.C. 3504(a)(1)(B)(vi) (OMB); and 44 U.S.C. 3506(h)(5) (agencies).

<sup>20</sup>We have made recommendations to improve OMB's process for monitoring high-risk IT investments; see GAO, *Information Technology: OMB Can Make More Effective Use of Its Investment Reviews*, GAO-05-276 (Washington, D.C.: Apr. 15, 2005).

<sup>21</sup>This policy is set forth and guidance is provided in OMB Circular No. A-11 (Nov. 2, 2005) (section 300) and in OMB's *Capital Programming Guide*, which directs agencies to develop, implement, and use a capital programming process to build their capital asset portfolios.

<sup>22</sup>See, for example, GAO-04-394G; *Information Technology: A Framework for Assessing and Improving Enterprise Architecture Management (Version 1.1)*, GAO-03-584G (Washington, D.C.: April 2003); and *Assessing Risks and Returns: A Guide for Evaluating Federal Agencies' IT Investment Decision-making*, GAO/AIMD-10.1.13 (Washington, D.C.: February 1997).

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the enterprise’s current (“As Is”) environment and its target (“To Be”) environment. These snapshots consist of “views,” which are one or more interdependent and interrelated architecture products (e.g., models, diagrams, matrices, and text) that provide logical or technical representations of the enterprise. The architecture also includes a transition or sequencing plan, which is based on an analysis of the gaps between the “As Is” and “To Be” environments; this plan provides a temporal road map for moving between the two environments and incorporates such considerations as technology opportunities, marketplace trends, fiscal and budgetary constraints, institutional system development and acquisition capabilities, legacy and new system dependencies and life expectancies, and the projected value of competing investments.

The suite of products produced for a given entity’s enterprise architecture, including its structure and content, is largely governed by the framework used to develop the architecture. Since the 1980s, various architecture frameworks have been developed, such as John A. Zachman’s “A Framework for Information Systems Architecture”<sup>23</sup> and the DOD Architecture Framework.<sup>24</sup>

The importance of developing, implementing, and maintaining an enterprise architecture is a basic tenet of both organizational transformation and systems modernization. Managed properly, an enterprise architecture can clarify and help optimize the interdependencies and relationships among an organization’s business operations (and the underlying IT infrastructure and applications) that support these operations. Moreover, when an enterprise architecture is employed in concert with other important management controls, such as portfolio-based capital planning and investment control practices, architectures can greatly increase the chances that an organization’s operational and IT environments will be configured to optimize mission performance. Our experience with federal agencies has shown that investing in IT without defining these investments in the context of an

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<sup>23</sup>J.A. Zachman, “A Framework for Information Systems Architecture,” *IBM Systems Journal* 26, no. 3 (1987).

<sup>24</sup>DOD, *Department of Defense Architecture Framework*, Version 1.0, Volume 1 (August 2003) and Volume 2 (February 2004).

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architecture often results in systems that are duplicative, not well integrated, and unnecessarily costly to maintain and interface.<sup>25</sup>

One approach to structuring an enterprise architecture is referred to as a federated enterprise architecture. Such a structure treats the architecture as a family of coherent but distinct member architectures that conform to an overarching architectural view and rule set. This approach recognizes that each member of the federation has unique goals and needs as well as common roles and responsibilities with the levels above and below it. Under a federated approach, member architectures are substantially autonomous, although they also inherit certain rules, policies, procedures, and services from higher-level architectures. As such, a federated architecture enables component organization autonomy while ensuring enterprise-wide linkages and alignment where appropriate. Where commonality among components exists, there are also opportunities for identifying and leveraging shared services.

A service-oriented architecture (SOA) is an approach for sharing business capabilities across the enterprise by designing functions and applications as discrete, reusable, and business-oriented services. As such, service orientation permits sharing capabilities that may be under the control of different component organizations. As we have previously reported,<sup>26</sup> such capabilities or services need to be, among other things, (1) self-contained, meaning that they do not depend on any other functions or applications to execute a discrete unit of work; (2) published and exposed as self-describing business capabilities that can be accessed and used; and (3) subscribed to via well-defined and standardized interfaces. A SOA approach is thus not only intended to reduce redundancy and increase integration, but also to provide the kind of flexibility needed to support a quicker response to changing and evolving business requirements and emerging conditions.

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<sup>25</sup>See, for example, GAO, *Homeland Security: Efforts Under Way to Develop Enterprise Architecture, but Much Work Remains*, GAO-04-777 (Washington, D.C.: Aug. 6, 2004); GAO-04-731R; *Information Technology: Architecture Needed to Guide NASA's Financial Management Modernization*, GAO-04-43 (Washington, D.C.: Nov. 21, 2003); GAO-03-1018; GAO-03-877R; *Information Technology: DLA Should Strengthen Business Systems Modernization Architecture and Investment Activities*, GAO-01-631 (Washington, D.C.: June 29, 2001); and *Information Technology: INS Needs to Better Manage the Development of Its Enterprise Architecture*, GAO/AIMD-00-212 (Washington, D.C.: Aug. 1, 2000).

<sup>26</sup>GAO, *Information Technology: FBI Has Largely Staffed Key Modernization Program, but Strategic Approach to Managing Program's Human Capital Is Needed*, GAO-07-19 (Washington, D.C.: Oct. 16, 2006).

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## IT Investment Management: A Brief Description

IT investment management is a process for linking IT investment decisions to an organization's strategic objectives and business plans that focuses on selecting, controlling, and evaluating investments in a manner that minimize risks while maximizing the return of investment.<sup>27</sup>

- During the selection phase, the organization (1) identifies and analyzes each project's risks and returns before committing significant funds to any project and (2) selects those IT projects that will best support its mission needs.
- During the control phase, the organization ensures that, as projects develop and investment expenditures continue, they continue to meet mission needs at the expected levels of cost and risk. If the project is not meeting expectations or if problems arise, steps are quickly taken to address the deficiencies.
- During the evaluation phase, actual versus expected results are compared once a project has been fully implemented. This is done to (1) assess the project's impact on mission performance, (2) identify any changes or modifications to the project that may be needed, and (3) revise the investment management process based on lessons learned.

Consistent with this guidance, our IT Investment Management framework (ITIM)<sup>28</sup> consists of five progressive stages of maturity for any given agency relative to selecting, controlling, and evaluating its investment management capabilities. (See fig. 2 for the five ITIM stages of maturity.) Stage 2 critical processes lay the foundation by establishing successful, predictable, and repeatable investment control processes at the project level. Stage 3 is where the agency moves from project-centric processes to portfolio-based processes and evaluates potential investments according to how well they support the agency's missions, strategies, and goals. Organizations implementing these Stages 2 and 3 practices have in place selection, control, and evaluation processes that are consistent with the Clinger-Cohen Act.<sup>29</sup> Stages 4 and 5 require the use of evaluation

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<sup>27</sup> GAO-04-394G; GAO, [GAO/AIMD-10.1.13; Executive Guide: Improving Mission Performance Through Strategic Information Management and Technology, GAO/AIMD-94-115](#) (Washington, D.C.: May 1994); and Office of Management and Budget, [Evaluating Information Technology Investments, A Practical Guide](#) (Washington, D.C.: November 1995).

<sup>28</sup> GAO-04-394G.

<sup>29</sup> 40 U.S.C. §§ 11311-11313.

techniques to continuously improve both investment processes and portfolios in order to better achieve strategic outcomes.

**Figure 2: The Five ITIM Stages of Maturity with Critical Processes**

Maturity stages	Critical processes
<b>Stage 5:</b> Leveraging IT for strategic outcomes	- Optimizing the investment process - Using IT to drive strategic business change
<b>Stage 4:</b> Improving the investment process	- Improving the portfolio's performance - Managing the succession of information systems
<b>Stage 3:</b> Developing a complete investment portfolio	- Defining the portfolio criteria - Creating the portfolio - Evaluating the portfolio - Conducting postimplementation reviews
<b>Stage 2:</b> Building the investment foundation	- Instituting the investment board - Meeting business needs - Selecting an investment - Providing investment oversight - Capturing investment information
<b>Stage 1:</b> Creating investment awareness	<i>IT spending without disciplined investment processes</i>

Source: GAO.

The overriding purpose of the framework is to encourage investment selection, control, and evaluate processes that promote business value and mission performance, reduce risk, and increase accountability and transparency. We have used the framework in several of our evaluations,<sup>30</sup> and a number of agencies have adopted it. With the exception of the first stage, each maturity stage is composed of “critical processes” that must be implemented and institutionalized in order for the organization to achieve that stage. Each ITIM critical process consists of “key practices”—to

<sup>30</sup>GAO, *Information Technology: Centers for Medicare & Medicaid Services Needs to Establish Critical Investment Management Capabilities*, GAO-06-12 (Washington, D.C.: Oct. 28, 2005); *Information Technology: HHS Has Several Investment Management Capabilities in Place, but Needs to Address Key Weaknesses*, GAO-06-11 (Washington, D.C.: Oct. 28, 2005); *Information Technology: FAA Has Many Investment Management Capabilities in Place, but More Oversight of Operational Systems Is Needed*, GAO-04-822 (Washington, D.C.: Aug. 20, 2004); *Information Technology: Departmental Leadership Crucial to Success of Investment Reforms at Interior*, GAO-03-1028 (Washington, D.C.: Sept. 12, 2003); *Bureau of Land Management: Plan Needed to Sustain Progress in Establishing IT Investment Management Capabilities*, GAO-03-1025 (Washington, D.C.: Sept. 12, 2003); *United States Postal Service: Opportunities to Strengthen IT Investment Management Capabilities*, GAO-03-3 (Washington, D.C.: Oct. 15, 2002); and *Information Technology: DLA Needs to Strengthen Its Investment Management Capability*, GAO-02-314 (Washington, D.C.: Mar. 15, 2002).

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include organizational structures, policies, and procedures—that must be executed to implement the critical process. Our research shows that agency efforts to improve investment management capabilities should focus on implementing all lower stage practices before addressing higher stage practices.

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## DOD's Institutional Approach to Business Systems Modernization

In 2005, the department reassigned responsibility for providing executive leadership for the direction, oversight, and execution of its business systems modernization efforts to several entities. These entities and their responsibilities include the Defense Business Systems Management Committee (DBSMC), which serves as the highest ranking governance body for business systems modernization activities; the Principal Staff Assistants, who serve as the certification authorities for business system modernizations in their respective core business missions; the IRBs, which form the review and decision-making bodies for business system investments in their respective areas of responsibility; and the Business Transformation Agency (BTA), which is responsible for leading and coordinating business transformation efforts across the department. The BTA is organized into seven directorates, one of which is the Defense Business Systems Acquisition Executive—the component acquisition executive for DOD enterprise-level (DOD-wide) business systems and initiatives. This office is responsible for developing, coordinating, and integrating enterprise-level projects, programs, systems and initiatives, including managing resources such as fiscal, personnel, and contracts for assigned systems and programs.

Table 1 lists these entities and provides greater detail on their roles, responsibilities, and composition.

**Table 1: DOD Business Systems Modernization Governance Entities' Roles, Responsibilities, and Composition**

Entity	Roles and responsibilities	Composition
DBSMC	<ul style="list-style-type: none"><li>Provides strategic direction and plans for the business mission area<sup>a</sup> in coordination with the warfighting and enterprise information environment mission areas.</li><li>Recommends policies and procedures required to integrate DOD business transformation and attain cross-department, end-to-end interoperability of business systems and processes.</li><li>Serves as approving authority for business system modernization.</li><li>Establishes policies and approves the business mission area strategic plan, the enterprise transition plan for implementation for business systems modernization, the transformation program baseline, and the BEA.</li></ul>	Chaired by the Deputy Secretary of Defense; Vice Chair is the Under Secretary of Defense for Acquisition, Technology, and Logistics (USD(AT&L)). Includes senior leadership in the Office of the Secretary of Defense, the military departments' secretaries, and defense agencies' heads, such as the Assistant Secretary of Defense (Networks and Information Integration)/Chief Information Officer (ASD(NII)/CIO), the Vice Chairman of the Joint Chiefs of Staff, and the Commanders of the U.S. Transportation Command and Joint Forces Command.
Principal Staff Assistants/Certification Authorities	<ul style="list-style-type: none"><li>Support the DBSMC's management of enterprise business IT investments.</li><li>Serve as the certification authorities accountable for the obligation of funds for respective business system modernizations within designated core business missions.<sup>b</sup></li><li>Provide the DBSMC with recommendations for system investment approval.</li></ul>	Under Secretaries of Defense for Acquisition, Technology, and Logistics; Comptroller; and Personnel and Readiness.
IRBs	<ul style="list-style-type: none"><li>Serve as the oversight and investment decision-making bodies for those business capabilities that support activities under their designated areas of responsibility.</li><li>Recommend certification for all business systems investments costing more than \$1 million that are integrated and compliant with the BEA.</li></ul>	Includes the Principal Staff Assistants; Joint Staff; ASD(NII)/CIO; core business mission area representatives; military departments; defense agencies; and combatant commands.
Component Pre-Certification Authority	<ul style="list-style-type: none"><li>Ensures component-level investment review processes integrate with the Investment Management system.</li><li>Identifies those component systems that require IRB certification and prepare, review, approve, validate, and transfer investment documentation as required.</li><li>Assesses and precertifies architecture compliance of component systems submitted for certification and annual review.</li><li>Acts as the component's principal point of contact for communication with the IRBs.</li></ul>	Includes the Chief Information Officer from the Air Force, the Principal Director of Governance, Acquisition, and Chief Knowledge Office from the Army, the Chief Information Officer from the Navy, and comparable representatives from other defense agencies.

Entity	Roles and responsibilities	Composition
BTA	<ul style="list-style-type: none"> <li>• Operates under the authority of the USD(AT&amp;L) under the direction of the Deputy Under Secretary of Defense for Business Transformation and the Deputy Under Secretary of Defense for Financial Management.</li> <li>• Maintains and updates the department's BEA and enterprise transition plan.</li> <li>• Ensures that functional priorities and requirements of various defense components, such as the Army and Defense Logistics Agency are reflected in the architecture.</li> <li>• Ensures adoption of DOD-wide information and process standards as defined in the architecture.</li> <li>• Serves as the day-to-day management entity of the business transformation effort at the DOD enterprise level.</li> <li>• Provides support to the DBSMC and IRBs.</li> </ul>	Comprised of seven directorates (Defense Business Systems Acquisition Executive, Enterprise Integration, Transformation Planning and Performance, Transformation Priorities and Requirements, Investment Management, Warfighter Support Office, and Chief of Staff).

Source: DOD.

<sup>a</sup>According to DOD, the business mission area is responsible for ensuring that capabilities, resources, and materiel are reliably delivered to the warfighter. Specifically, the BMA addresses areas such as real property and human resources management.

<sup>b</sup>DOD has five core business missions: Human Resources Management, Weapon System Lifecycle Management, Materiel Supply and Service Management, Real Property and Installations Lifecycle Management, and Financial Management.

## Tiered Accountability

In 2005, DOD reported that it had adopted a tiered accountability approach to business transformation. Under this approach, responsibility and accountability for business architectures and systems investment management are assigned to different levels in the organization. For example, the BTA is responsible for developing the corporate BEA, which provides the thin layer of corporate policies, capabilities, standards, and rules. The components are responsible for defining a component-level architecture and transition plans associated with their own tier of responsibility and for doing so in a manner that is aligned with (i.e., does not violate) the corporate BEA's policies, capabilities, standards, and rules. Similarly, program managers are responsible for developing program-level architectures and plans and ensuring alignment with the architectures and transition plans above them. As such, this concept allows for autonomy while also ensuring linkages and alignment from the program level through the component level to the enterprise level.

For business investment management, responsibility and accountability is also tiered, meaning that it is allocated between the DOD corporate level (i.e., Office of the Secretary of Defense) and the components based on the amount of development/modernization funding involved and the

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investment's designated "tier." More specifically, DOD corporate is responsible for ensuring that all business systems with a development/modernization investment in excess of \$1 million are reviewed by the IRBs for compliance with the BEA, certified by the Principal Staff Assistants, and approved by the DBSMC. Components are responsible for certifying development/modernization investments with total costs of \$1 million or less. All DOD development and modernization efforts are also assigned a "tier" based on acquisition category and/or the size of the financial investment.<sup>31</sup>

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## Summary of Fiscal Year 2005 National Defense Authorization Act Requirements

Congress included six provisions in the act<sup>32</sup> that are aimed at ensuring DOD's development of a well-defined BEA and associated enterprise transition plan (ETP), as well as the establishment and implementation of effective investment management structures and processes. The requirements are as follows:

1. Develop a BEA that:
  - includes an information infrastructure that, at a minimum, would enable DOD to:
    - comply with all federal accounting, financial management, and reporting requirements;
    - routinely produce timely, accurate, and reliable financial information for management purposes;
    - integrate budget, accounting, and program information and systems;

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<sup>31</sup>As defined in the department's *Investment Review Board Concept of Operations* and its *Investment Certification and Annual Review Process User Guidance*, there are four tiers of business systems. Tier 1 systems include all systems that are classified as a "major automated information system" or a "major defense acquisition program;" tier 2 systems include those with modernization efforts of \$10 million or greater but that are not designated as a major automated information system or a major defense acquisition program, or programs that have been designated as IRB interest programs because of their impact on DOD transformation objectives; tier 3 systems include those with modernization efforts that have anticipated costs greater than \$1 million but less than \$10 million; and tier 4 systems are those with modernization efforts that have anticipated costs of up to \$1 million.

<sup>32</sup>Ronald W. Reagan National Defense Authorization Act for Fiscal Year 2005, Pub. L. No. 108-375, § 332, 118 Stat. 1811, 1851-1856 (Oct. 28, 2004) (codified in part at 10 U.S.C. § 2222).

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- provide for the systematic measurement of performance, including the ability to produce timely, relevant, and reliable cost information;
  - includes policies, procedures, data standards, and system interface requirements that are to be applied uniformly throughout the department; and
  - is consistent with OMB policies and procedures.
2. Develop a transition plan for implementing the architecture that includes:
    - an acquisition strategy for new systems needed to complete the enterprise architecture;
    - a list and schedule of legacy business systems to be terminated;
    - a list and strategy of modifications to legacy business systems; and
    - time-phased milestones, performance metrics, and a statement of financial and non-financial resource needs.
  3. Identify each business system proposed for funding in DOD's fiscal year budget submissions and include:
    - information on each business system proposed for funding in that budget;
    - funds for current services and for business systems modernization; and
    - the designated approval authority for each business system.
  4. Delegate the responsibility for business systems to designated approval authorities within the Office of the Secretary of Defense.
  5. Require each approval authority to establish investment review structures and processes, including a hierarchy of IRBs—each with appropriate representation from across the department. The review process must cover:
    - review and approval of each business system by an IRB before funds are obligated;
    - at least an annual review of every business system investment;

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- use of threshold criteria to ensure an appropriate level of review and accountability;
  - use of procedures for making architecture compliance certifications;
  - use of procedures consistent with DOD guidance; and
  - incorporation of common decision criteria.
6. Effective October 1, 2005, DOD may not obligate appropriated funds for a defense business system modernization with a total cost of more than \$1 million unless, the approval authority certifies that the business system modernization:
- complies with the BEA and
  - is necessary to achieve a critical national security capability or address a critical requirement in an area such as safety or security; or is necessary to prevent a significant adverse effect on an essential project in consideration of alternative solutions, and the certification is approved by the DBSMC.

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## Summary of Recent GAO Reviews of DOD's Business Systems Modernization and Business Transformation Efforts

In November 2005<sup>33</sup> and in May 2006,<sup>34</sup> we reported that DOD had partially satisfied four of the six business system modernization requirements in the fiscal year 2005 National Defense Authorization Act<sup>35</sup> relative to architecture development, transition plan development, budgetary disclosure, and investment review; it had fully satisfied the requirement concerning designated approval authorities; and it was in the process of satisfying the last requirement for certification and approval of modernizations costing in excess of \$1 million. As a result, we concluded that the department had made important progress in defining and beginning to implement institutional management controls (i.e., processes, structures, and tools), but much remained to be accomplished relative to the act's requirements and relevant guidance, including developing

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<sup>33</sup>GAO, *DOD Business Systems Modernization: Important Progress Made in Establishing Foundational Architecture Products and Investment Management Practices, but Much Work Remains*, GAO-06-219 (Washington, D.C.: Nov. 23, 2005).

<sup>34</sup>[GAO-06-658](#).

<sup>35</sup>Ronald W. Reagan National Defense Authorization Act for Fiscal Year 2005, Pub. L. No. 108-375, § 332, 118 Stat. 1811, 1851-1856 (Oct. 28, 2004) (codified in part at 10 U.S.C. § 2222).

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component architectures that are aligned with the corporate BEA and ensuring that investment review and approval processes are fully developed and institutionally implemented across all organizational levels.

Notwithstanding this progress on business systems modernization, we also testified in November 2006<sup>36</sup> that DOD continued to lack a comprehensive, enterprise-wide approach to its overall business transformation effort. We noted that while DOD's planning and management continued to evolve, it had yet to develop a comprehensive, integrated, and enterprise-wide plan that covered all key business functions and contained results-oriented goals, measures, and expectations that link organizational, unit, and individual performance goals while also being clearly linked to DOD's overall investment plans. We concluded that because of the complexity and long-term nature of business transformation, the department continued to need a chief management official with significant authority, experience, and tenure to provide sustained leadership and integrate its overall business transformation effort. We also concluded that without formally designating responsibility and accountability for results, reconciling competing priorities in investments will be difficult and could impede DOD's progress in its transformation efforts. We are currently assessing the department's business transformation efforts, including an analysis of the various proposals for a chief management officer and its response to these proposals, and plan to report our results in the near future.

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## DOD Is Continuing to Improve Its Approach to Modernizing Business Systems

DOD continues to take steps to comply with the requirements of the act and to satisfy relevant systems modernization management guidance. In particular, on March 15, 2007, DOD released an update to its BEA (version 4.1), developed an updated ETP, and issued its annual report to Congress describing steps taken and planned relative to the act's requirements, among other things. Collectively, these steps address several legislative provisions and best practices concerning the corporate architecture, transition plan, budgetary disclosure, and investment review of systems costing in excess of \$1 million that we previously reported as missing. However, additional steps are needed to fully comply with the act and relevant guidance. Specifically, the department has yet to extend and evolve its corporate BEA to the department's component organizations' (military departments and defense agencies) architectures, fully define its

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<sup>36</sup> GAO-07-229T.

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IT investment management policies and procedures, and officially establish one of the five legislatively mandated IRBs. BTA officials agree that additional steps are needed to fully implement the act's requirements and related system modernization management best practices. According to BTA officials, DOD leadership is committed to fully addressing these areas and efforts are planned and under way to do so.

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## DOD Continues to Improve Its Corporate BEA, but Component Architectures Remain a Challenge

Among other things, the act requires DOD to develop a BEA that would cover all defense business systems and the functions and activities supported by defense business systems and enable the entire department to (1) comply with all federal accounting, financial management, and reporting requirements; (2) routinely produce timely, accurate, and reliable financial information for management purposes; and (3) include policies, procedures, data standards, and system interface requirements that are to be applied throughout the department.

In 2006,<sup>37</sup> we reported that the then current version of the BEA (version 3.1) addressed several of the missing elements we had previously identified relative to the act's requirements and relevant guidance. However, we also reported that additional steps were needed. On March 15, 2007, DOD released an update to its BEA (version 4.1), which resolves several of the architecture gaps associated with the prior version and adds content proposed by DOD stakeholders.<sup>38</sup> For example, version 4.1 improves the Financial Visibility business enterprise priority (BEP) area by including the Standard Financial Information Structure data elements and business rules to support cost accounting and reporting. This version also addresses, to varying degrees, missing elements, inconsistencies, and usability issues that we previously identified.<sup>39</sup> Examples of these improvements and remaining issues are summarized in the following text:

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<sup>37</sup> GAO-06-658.

<sup>38</sup> According to DOD, the BEA stakeholders include the core business mission areas through the Business Enterprise Priorities, which comprises Personnel Visibility, Acquisition Visibility, Common Supplier Engagement, Materiel Visibility, Real Property Accountability, and Financial Visibility. The department added that as the BEA evolves, the stakeholders will include components that must federate their architectures to the BEA, program managers who must comply with the BEA, IRBs who use the BEA to guide and constrain investments, and systems designers and integrators who must build and configure their systems to comply with the BEA.

<sup>39</sup> GAO-06-658.

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- This latest version contains enterprise-level information about DOD’s “As Is” architectural environment to support business capability gap analyses. As we previously reported,<sup>40</sup> such gap analyses between the “As Is” and the “To Be” environments are essential for the development of a well-defined transition plan. However, such gap analyses were not previously provided for in prior versions of the BEA. To DOD’s credit, the architecture now includes “As Is” information (e.g., problems that enterprise priorities are to address and the root causes of each problem) for five of the six BEPs. For example, this version identifies the “inability to record or report funds distribution at the transaction level” as a problem for the Financial Visibility priority area, and “stove-pipe systems” and “non-standard forms” as the root causes. Moreover, it includes “As Is” information about related enterprise systems, such as the Wide-area Workflow system. However, the current version does not provide “As Is” information for the Acquisition Visibility priority area.
  - The latest version includes performance metrics for the business capabilities within enterprise priority areas, including actual performance relative to performance targets that are to be met. For example, currently 26 percent of DOD assets are reported by using the Department of the Treasury’s United States Standard General Ledger<sup>41</sup> compliant formats, as compared to a target of 100 percent. However, the architecture does not describe the actual baseline performance for operational activities, such as for the “Manage Audit and Oversight of Contractor” operational activity. As we have previously reported,<sup>42</sup> performance models are an essential part of any architecture and having defined performance baselines to measure actual performance against provides the means for knowing whether the intended mission value to be delivered by each business process is actually being realized.
  - The latest version identifies activities performed at each location/organization and indicates which organization(s) are or will be involved in each activity. We previously reported that prior versions did not address the locations where specified activities are to occur and that doing so is important because the cost and performance of implemented business operations and technology solutions are affected by the location and therefore need to be examined, assessed, and decided on in an

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<sup>40</sup>[GAO-06-219](#).

<sup>41</sup>The United States Standard General Ledger provides a uniform chart of accounts and technical guidance used in standardizing federal agency accounting.

<sup>42</sup>[GAO-04-777](#) and [GAO-03-584G](#).

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enterprise context rather than in a piecemeal, systems-specific fashion.<sup>43</sup> To DOD’s credit, the latest version includes some of this information. For example, it indicates that the Defense Contract Management Agency is involved in the “Conduct Acquisition Assessment” operational activity. However, not all operational activities, such as “Authorize Return or Disposal” activity are assigned to a location/organization. In addition, the latest version does not include the roles and responsibilities of organizations performing the same operational activities, which is important to avoid duplication and inconsistency in how functions and activities are implemented.

- The latest version includes common policies (e.g., “IRBs approve only those system investments that are aligned with enterprise transformation objectives and standards”) and procedures (e.g., “Components and programs use the Architecture Compliance and Requirements Traceability tool to illustrate how their system investments map to applicable activities, business rules, and data in the BEA”). It also includes business rules (e.g., “each request for commercial export of DOD technology must be processed within 30 days upon receipt of request from the Department of State or the Department of Commerce”) to facilitate consistent implementation of the policies and procedures.<sup>44</sup> However, the architecture does not identify enterprise business rules for all business processes. For example, there are no business rules for the Common Supplier Engagement business process “Perform Acceptance Procedures for Other Goods and Services.” Moreover, the latest version continues to provide inconsistent levels of detail for some business rules. For example, some business rules are defined at the conceptual level (e.g., “ENT\_Cost\_Report”) while others are defined at a more operational level (e.g., “ENT\_DOD\_Obligations\_Against”). Without well-defined business rules, it is likely that policies and procedures will be implemented inconsistently because they will be uniquely interpreted.
- The latest version provides information flows among some organizational units, business operations, and system elements. These information flows are intended to show what information is needed and where and how the information moves and is shared to support mission functions. For example, the “Financial Management Detail” operational node connectivity diagram is a graphical depiction of the operational nodes (or

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<sup>43</sup> GAO-06-658.

<sup>44</sup> Business rules are important because they explicitly translate business policies and procedures into specific, unambiguous rules that govern what can and cannot be done.

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organizations) with “needlines” that indicate a need to exchange information and identify information exchange requirements among the financial management organizational units (e.g., between the accounting office and commercial entitlement office operational nodes). However, detailed operational node connectivity diagrams similar to the “Financial Management Detail” diagram have not yet been developed for the other core business mission areas, such as Human Resources Management. Such information is critical for defining business service interactions and establishing interfaces between users and systems. Moreover, the BEA does not include information flows between the enterprise and DOD components. Such information is important for developing a common understanding of the semantic meaning of information exchanges among DOD organizations.

- The latest version continues to represent the thin layer of DOD-wide corporate architectural policies, capabilities, rules, and standards. Having this layer is essential to a well-defined federated architecture, but it alone does not provide the total federated family of DOD parent and subsidiary architectures for the business mission area that are needed to comply with the act. As we recently reported, well-defined architectures do not yet exist for the military departments,<sup>45</sup> which constitute the largest members of the federation. In particular, we reported that none of the three military departments had fully developed architecture products that describe their respective target architectural environments and developed transition plans for migrating to a target environment, and none were employing the full range of architecture management structures, processes, and controls provided for in relevant guidance. Accordingly, we made recommendations aimed at improving the management and content of the military departments’ respective architectures, which the department agreed with.<sup>46</sup> (See app. III for the specific recommendations.)

Recognizing the need to address its component architecture challenge, the BTA released its business mission area federation strategy and road map in September 2006 to address how the corporate BEA would be extended to the military departments and defense agencies. We recently reported<sup>47</sup> that this strategy provides a foundation on which to build and align DOD’s parent business architecture with the subsidiary architectures of the

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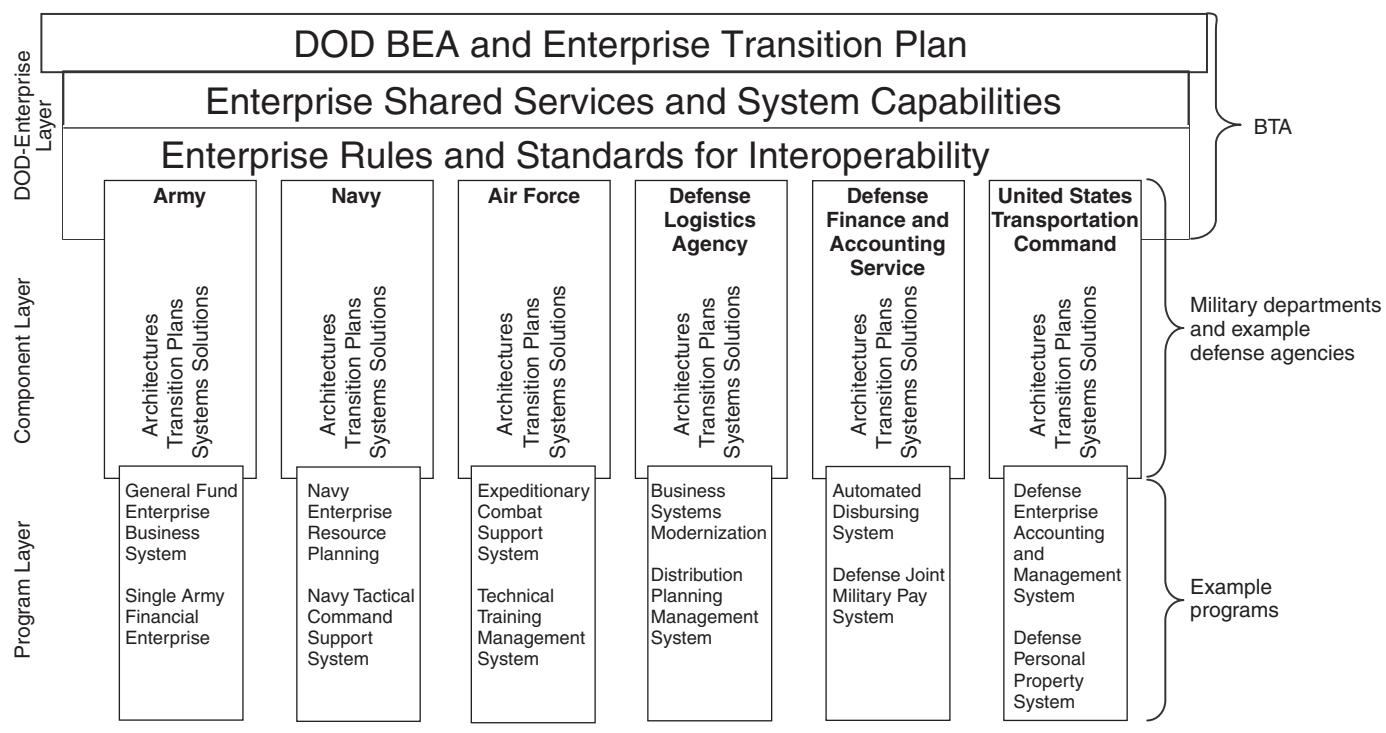
<sup>45</sup> GAO-06-831.

<sup>46</sup> GAO-06-831.

<sup>47</sup> GAO-07-451.

military departments and defense agencies (see fig. 3). In particular, we noted that the strategy (1) states the department's federated architecture goals; (2) describes federation concepts that are to be applied; and (3) includes high-level activities, capabilities, products, and services intended to facilitate implementation of the concepts.

**Figure 3: Simplified Diagram of DOD's Business Mission Area Federated Architecture**



However, we also reported that the strategy does not adequately define the tasks needed to achieve the strategy's goals, including those associated with executing high-level activities and providing related capabilities, products, and services. Specifically, it does not adequately address how strategy execution will be governed, including assignment of roles and responsibilities, measurement of progress and results, and provision of resources. Also, the strategy does not address, among other things, how the component architectures will be aligned with the latest version of the BEA and how it will identify and provide for reuse of common applications and systems across the department. Accordingly, we made recommendations aimed at better defining the department's architecture

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federation plans, which the department largely disagreed with.<sup>48</sup> (See app. III for the specific recommendations.)

According to DOD, the corporate BEA focuses on providing tangible outcomes for a limited set of enterprise-level (DOD-wide) priorities, and the components are responsible under the department's tiered accountability approach for defining their respective component-level architectures that are aligned with the corporate BEA. According to DOD, subsequent releases of the BEA will continue to reflect this federated approach and will define enforceable interfaces to ensure interoperability and information flow to support decision making at the appropriate level. To help ensure this, the BTA plans to have its BEA independent verification and validation contractor examine architecture federation when evaluating subsequent BEA releases. Use of an independent verification and validation agent is an architecture management best practice for identifying architecture strengths and weaknesses. Through the use of such an agent, department and congressional oversight bodies can gain information that they need to better ensure that DOD's family of architectures and associated transition plan(s) satisfy key quality parameters, such as completeness, consistency, understandability, and usability, which the department's annual reports have yet to include.

Until DOD has a well-defined family of architectures for its business mission area, it will not fully satisfy the requirements of the act and it will remain challenged in its ability to effectively manage its business system modernization efforts.

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## DOD Continues to Expand and Update Its Enterprise Transition Plan, but Important Elements Are Still Missing

Among other things, the act requires DOD to develop an ETP for implementing its BEA that includes listings of the legacy systems that will and will not be part of the target business systems environment and specific time-phased milestones and performance metrics.

In 2006,<sup>49</sup> we reported that the prior version of the ETP addressed several of the missing elements that we previously identified relative to the act's requirements and relevant guidance. However, we also reported that additional steps were needed. On March 15, 2007, DOD released an updated version of its ETP, which provides information on 106 of what it

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<sup>48</sup> GAO-07-451.

<sup>49</sup> GAO-06-658.

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refers to as transformational programs (systems and initiatives) and relates these to key transformational objectives. For example, it includes specific time-phased milestones<sup>50</sup> for about 86 business system investments and initiatives and performance metrics for about 84 systems and initiatives. Further, the ETP discusses progress made on business system investments over the last 6 months—including key accomplishments and milestones attained, as well as new information on near-term activities (i.e., activities to occur during the next 6 months). This version also addresses, to varying degrees, missing elements that we identified in our prior report.<sup>51</sup> Examples of these improvements and remaining issues are summarized in the following text:

- The latest version of the ETP documents the results of ongoing and planned analyses of gaps between its “As Is” and “To Be” architectural environments, in which capability and performance shortfalls are described and investments (such as transformation initiatives and systems) that are to address these shortfalls are clearly identified. For example, it aligns the Defense Integrated Military Human Resources System with the Personnel Visibility priority area and states that it will provide business capability improvements that include providing accurate and timely pay benefits for military service members and their families anytime and anywhere. However, the gap analysis is not yet completed for all the current BEPs. In particular, the gap analysis did not include the Acquisition Visibility priority area. Without identifying how business capability gaps between the baseline and target architecture are to be addressed for all BEPs, the department’s transition plan cannot be considered sufficiently complete, and thus its ability to support informed investment selection and control decisions is limited.
- The latest version of the ETP provides a range of information for the 106 systems and initiatives identified, such as 3 years of budget information for 64 of these systems and initiatives. However, the plan has yet to address our prior finding for including system and budget information for

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<sup>50</sup>The time-phased milestones refer to milestones, such as initial operating capability, full operating capability, technology development phase, and system development and demonstration phase.

<sup>51</sup>[GAO-06-658](#).

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investments by 13 of its 15 defense agencies<sup>52</sup> and for 8 of its 9 combatant commands.<sup>53</sup> BTA officials told us that information for these defense agencies and combatant commands is not included because the ETP focused on the largest business-related organizations in DOD (i.e., those having the majority of the tier 1 and 2 business investments), and the majority of the defense agencies and commands do not have investments that meet this threshold criteria. Nevertheless, they said that they plan to include all component tier 1 and 2 systems over the next 3 years.

- The latest version also provides performance measures for the enterprise and component transformation programs, including key milestones (e.g., Initial Operating Capability). However, the ETP does not include other important information needed to understand the sequencing of these business investments. In particular, the planned investments in the transition plan are not sequenced based on a range of activities that are critical to developing an effective transition plan. More specifically, we previously reported<sup>54</sup> that the plan is largely based on a bottom-up planning process in which ongoing programs were examined and categorized in the plan around BEPs and capabilities, including a determination as to which programs would be designated and managed as DOD-wide, enterprise programs versus component programs. This bottom-up approach to developing the plan does not explicitly reflect transition planning key practices cited in federal guidance, such as consideration of technology opportunities, marketplace trends, fiscal and budgetary constraints, institutional system development and acquisition capabilities, and new and legacy system dependencies and life expectancies, and the

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<sup>52</sup>DOD included system and budget information for the Defense Financial and Accounting Service and Defense Logistics Agency in the transition plan. DOD did not include this information for the following defense agencies: (1) Missile Defense Agency, (2) Defense Advanced Research Projects Agency, (3) Defense Commissary Agency, (4) Defense Contract Audit Agency, (5) Defense Contract Management Agency, (6) Defense Information Systems Agency, (7) Defense Intelligence Agency, (8) Defense Legal Services Agency, (9) Defense Security Cooperation Agency, (10) Defense Security Service, (11) Defense Threat Reduction Agency, (12) National Geospatial-Intelligence Agency, and (13) National Security Agency.

<sup>53</sup>DOD included system and budget information for the Transportation Command in the transition plan. DOD did not include this information for the (1) Central Command, (2) Joint Forces Command, (3) Pacific Command, (4) Southern Command, (5) Space Command, (6) Special Operations Command, (7) European Command, and (8) Strategic Command.

<sup>54</sup>[GAO-06-219](#).

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projected value of competing investments.<sup>55</sup> For example, many of these investments are dependent on Net-Centric Enterprise Services (NCES)<sup>56</sup> for its core services, and as such the plans and milestones for each should reflect the incremental capability deployment of NCES. According to the BTA official responsible for the ETP, the transition plan investments have not been sequenced based on any of these considerations other than fiscal year budgetary constraints. However, DOD officials reported that the BTA intends to depict the dependencies in the ETP, especially program-to-program dependencies associated with adoption of a service-oriented architecture approach. BTA officials also said that each technology-based sequencing decision will be governed by DOD's tiered accountability approach to investment decision making and architecture federation.

- The latest version of the ETP includes a listing of the legacy systems that will not be part of the “To Be” environment and the termination dates for many of these systems. We previously reported<sup>57</sup> that the prior version did not include a complete listing of the legacy systems and that the termination dates for many legacy systems, including the Personnel Records Management System, Defense Departmental Reporting System, and Base Accounts Receivable System, were not known, making it unclear whether or not they will be part of the target environment. To DOD’s credit, the ETP now reflects all decisions recorded to date on these legacy system terminations. According to the department, this list will continue to evolve as components and IRBs make investment decisions in the future. In addition, it provides information on legacy system migration and retirement as a result of implementing each target system. According to DOD, the annual report lists over 700 systems targeted for elimination as a result of the implementation of targeted business systems, with specific termination dates identified for over 93 percent of these systems.

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<sup>55</sup> GAO-03-584G and CIO Council, *A Practical Guide to Federal Enterprise Architecture, Version 1.0* (February 2001).

<sup>56</sup> NCES is intended to provide capabilities that are key to enabling ubiquitous access to reliable decision-quality information. NCES capabilities can be packaged into four product lines: service-oriented architecture foundation (e.g., security and information assurance), collaboration (e.g., application sharing), content discovery and delivery (e.g., delivering information across the enterprise), and portal (e.g., user-defined Web-based presentation).

<sup>57</sup> GAO-06-658.

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- The latest version of the ETP also includes for the first time a discussion of how the department plans to use enterprise application integration,<sup>58</sup> including plans, methods, and tools for reusing applications that already exist while also adding new applications and databases. However, this discussion is nevertheless still notional and thus lacks specifics on which investments will reuse which applications.

According to BTA officials, a number of actions are envisioned to address the above cited areas and further improve the ETP, such as adding the results of capability gap analyses for all business priorities, including tier 1 and 2 programs for all components, and recognizing dependencies among investments. Until the ETP, or a federated family of such plans, either directly or by reference includes relevant information on the full inventory of investments across the department, (and does so in a manner that reflects consideration of the range of variables associated with a well-defined transition plan, such as timing dependencies among investments and the department's capability to manage them) it will not have a sufficient basis for informed investment decision making regarding disposition of the department's existing inventory of systems or for sequencing the introduction of modernized systems. To ensure that the above discussed shortcomings with the department transition plan(s) are made, we have previously made recommendations that the department is still in the process of addressing aimed at formalizing its plans for incrementally improving its transition plan. (See app. II for these recommendations.)

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#### DOD's Fiscal Year 2008 Budget Submission Includes Key Information on Business Systems

Among other things, the act requires DOD's annual IT budget submission to include key information on each business system for which funding is being requested, such as the system's designated approval authority and the appropriation type and amount of funds associated with development/modernization and current services (to operate and maintain the system).

The department's fiscal year 2008/2009 budget submission includes a range of information for business system investments requesting funding, such as the system's (1) name, (2) approval authority, (3) approved funding for fiscal year 2007, and (4) requested funding for fiscal year 2008. The

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<sup>58</sup>Enterprise application integration software is a commercial software product, commonly referred to as middleware, to permit two or more incompatible systems to exchange data from different databases.

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submission also identifies the amount of the fiscal year 2008 request that is for development/modernization versus operations/maintenance (i.e., current services). For example, the Army's General Fund Enterprise Business System, the amount of modernization funds related to "Other Procurement, Army" and "Research, Development, Testing and Evaluation, Army" are identified. For systems in excess of \$1 million in modernization funding, the submission also cites the DBSMC approval date, where applicable.

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### DOD Has Largely Established Key Investment Management Structures, but Related Policies and Procedures Are Missing

The act requires DOD to establish business system investment review structures, including the previously mentioned DBSMC and five IRBs, and processes that are consistent with the investment management provisions of the Clinger-Cohen Act.<sup>59</sup> As noted earlier, our ITIM framework provides five progressive stages of maturity for any given agency relative to selecting, controlling, and evaluating its IT investments. Organizations implementing Stages 2 and 3 practices have in place capabilities that assist in establishing selection, control, and evaluation structures, policies, procedures, and practices that are required by the investment management provisions of the Clinger-Cohen Act.

In 2006, we reported that DOD had established the DBSMC and four of the five IRBs defined in the act and that it had developed a range of processes governing how business system investments are to be reviewed and approved.<sup>60</sup> More recently, we reported on the extent to which the department's corporate approach to business system investment management comports with the stages in our ITIM framework that are associated with investment management provisions of the Clinger-Cohen Act.<sup>61</sup> In summary, we found that DOD had established important management structures needed to manage its business system investments, but it had not fully defined many of related policies and procedures that our framework identified as needed to effectively manage its business investments as individual projects (Stage 2) and as portfolios of projects (Stage 3).

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<sup>59</sup> 40 U.S.C. § 11312.

<sup>60</sup> GAO-06-658.

<sup>61</sup> GAO-07-538.

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## Investment Management Structures Have Been Largely Established

DOD has largely established the organizational structures that are associated with Stages 2 and 3 of our framework. Specifically, it has established an enterprise-wide investment board and subordinate boards that are responsible for business systems investment governance, including conducting investment certification and approval reviews and annual reviews as provided for in the act. The enterprise-wide board—the DBSMC—is composed of senior executives, including the Deputy Secretary of Defense and the ASD(NII)/CIO, as provided for in the act. Among other things, the DBSMC is responsible for establishing and implementing policies governing the organization's investment process and approving lower-level investment board processes and procedures. The subordinate boards include four IRBs that are composed of representatives from their respective core business mission, as well as representatives from the combatant commands, defense agencies, military departments, and Joint Chiefs of Staff. Among other things, they are responsible and accountable for overseeing and controlling certain business system investments, including ensuring compliance and consistency with the BEA. The department has also assigned responsibility to the USD(AT&L) for managing business system portfolio selection criteria.

Moreover, since we reported in 2006<sup>62</sup> that the department has established four of the five IRBs mandated by the act, efforts have begun to establish the fifth. Specifically, ASD(NII)/CIO officials told us that they are now in the process of establishing the Enterprise Information Environment Mission Area<sup>63</sup> IRB to support IT infrastructure and information assurance activities, as required by the act. According to these officials, the draft concept of operations for this IRB is being revised and will subsequently be approved by the ASD(NII)/CIO. While the IRB has not been officially established, the officials stated that it has been in effect for about a year and added that the chair is the DOD Deputy CIO, and its membership includes representatives from the Defense Information Systems Agency, the DOD mission areas, and the military departments. They also said that

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<sup>62</sup> GAO-06-658.

<sup>63</sup> The Enterprise Information Environment Mission Area enables the functions of the other mission areas (e.g., Warfighting Mission Area, Business Mission Area, and Defense Intelligence Mission Area) and encompasses communications, computing, and core enterprise service systems, equipment, or software that provide a common information capability or service for enterprise use.

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the Under Secretary of Defense (Comptroller) and the Joint Chiefs of Staff are operating in an advisory role.

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## Policies and Procedures Have Been Defined for Some, but Not All, Project-Level and Portfolio-Based Investment Management Activities

As we recently reported,<sup>64</sup> DOD has defined policies and procedures relative to several key practices in our ITIM framework that are associated with project-level investment management (Stage 2). To its credit, the department has, for example, documented policies and procedures for ensuring that systems support ongoing and future business needs through alignment with the BEA; developed procedures for identifying and collecting information about these systems to support DBSMC and IRB investment decision making; and assigned responsibility for ensuring that the information collected about projects meets the needs of DOD's investment review structures and processes. However, we reported that it had not developed the full range of project-level policies and procedures needed for effective investment management. In commenting on our report, DOD stated that under DOD's tiered accountability, these are performed at the component level, and that departmental policies and procedures established for overseeing execution of these practices by components are sufficient. We do not agree. Examples of the limitations in the department's project-level policies and procedures are summarized next, along with their significance.

- Policies and procedures do not address how business system investments that are past the development/modernization stage (i.e., in operations and maintenance) are to be governed or considered by the DBSMC or the IRBs. Given that DOD invests billions of dollars annually in operating and maintaining business systems, this is significant. While DOD officials stated that component-level policies and procedures address systems that are outside of development/modernization, best practices emphasize that the corporate investment boards should continue to review investment cost and performance baselines throughout their life cycles.
- Policies and procedures do not outline how the DBSMC and IRB certification and annual review processes are to be coordinated with other decision-support processes used at DOD, such as the Joint Capabilities Integration and Development System; the Planning, Programming,

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<sup>64</sup> GAO-07-538.

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Budgeting, and Execution system; and the Defense Acquisition System.<sup>65</sup> Without clear linkages among these processes, inconsistent and uninformed decision making may result.

- Procedures do not specify how the full range of cost, schedule, and benefit data is to be used by the IRBs in certification decisions. Without documenting how such boards are to consider cost, schedule, and benefits factors when making these decisions, the department cannot ensure that the boards and the DBSMC consistently and objectively select proposals that best meet the department's needs and priorities.
- Policies and procedures do not exist that provide for sufficient oversight and visibility into component-level investment management activities, including component reviews of systems in operations and maintenance and tier 4 investments. According to DOD officials, such oversight is accomplished through the department's tiered accountability approach. However, the department did not provide policies and procedures defining how the DBSMC and IRBs ensure visibility into these component processes. This is particularly important because, according to DOD, only 285 of about 3,100 total business systems have completed the IRB certification process and have been approved by the DBSMC. Moreover, they said that the remaining business systems have not been through the certification process and have not been given a tier designation. Without policies and procedures defining how the DBSMC and IRBs have visibility into and oversight of all business system investments, DOD risks components continuing to invest in systems that are duplicative, stovepiped, non-integrated, and unnecessarily costly to manage, maintain, and operate.

DOD's policies and procedures relative to portfolio-based business system investment management (Stage 3) are even less defined than those for project-level investment management. As we recently reported,<sup>66</sup> DOD has not defined any of the policies and procedures that our ITIM framework

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<sup>65</sup>The Joint Capabilities Integration and Development System is a need-driven management system used to identify future capabilities for DOD; the Planning, Programming, Budgeting, and Execution process is a calendar-driven management system for allocating resources and is comprised of four phases—planning, programming, budgeting, and executing—that define how budgets for each DOD component and the department as a whole are created, vetted, and executed; and the Defense Acquisition System is an event-driven system for managing product development and procurement and guides the acquisition process for DOD.

<sup>66</sup>GAO-07-538.

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identifies as needed for effective portfolio management. For example, the business mission area does not have documented policies and procedures for defining the criteria to be used for making portfolio selection decisions, creating the portfolio of business system investments, evaluating the performance of portfolio investments, and conducting postimplementation reviews of these investments. According to our ITIM framework, the development and use of portfolio selection criteria focuses on the synergistic benefits to be found among an agency's entire collection of investments, rather than just from the sum of the individual investments. Moreover, adequately documenting both the policies and the associated procedures that provide predictable, repeatable, and reliable investment selection and control and govern how an organization manages its IT investment portfolio(s) is important because doing so reduces investment risk of failure and provides the basis for having rigor, discipline, and repeatability in how investments are selected and controlled across the entire organization. In commenting on our recent report, DOD stated that it intends to improve departmental policies and procedures for business system investments by, for example, establishing a single governance structure, but plans or time frames for doing so had not been established.

Until DOD fully defines departmentwide policies and procedures for both individual projects and portfolios of projects, it risks selecting and controlling these business system investments in an inconsistent, incomplete, and ad hoc manner, which in turn reduces the chances that these investments will meet mission needs in the most cost-effective manner. Accordingly, our recent report made a series of recommendations to the department for strengthening both its project- and portfolio-level business system investment management policies and procedures.<sup>67</sup>

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<sup>67</sup>GAO-07-538.

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## DOD Continues to Approve and Review Business Systems, but Military Departments Processes for Doing So Are Still Evolving

The act specifies two basic requirements that took effect October 1, 2005, relative to DOD's obligation of funds for business system modernizations costing more than \$1 million. First, it requires that these modernizations be certified by a designated approval authority<sup>68</sup> as meeting specific criteria.<sup>69</sup> Second, it requires that the DBSMC approve each of these certifications. The act also states that failure to do so before the obligation of funds for any such modernization constitutes a violation of the Anti-deficiency Act.<sup>70</sup> In March 2006, the department reported that the DBSMC had approved 226 business system modernizations, and as of March 2007, it reported that the committee approved an additional 59 systems, for a total of 285 approved systems.

A key element of the department's approach to reviewing and approving business systems investments is the use of "tiered accountability," in which investment review begins at the component level and proceeds through a hierarchy of review and approval authorities, depending on the size and significance of the investment. Air Force, Army, and Navy officials told us that the success of the process depends on thorough analysis of each business system before it is submitted for higher-level review and approval. However, they added that their respective processes for reviewing investments are still evolving. A brief summary of each military department's investment review activities is provided in the following text.

### Air Force

Air Force officials report that their department is following a phased approach to conducting reviews of about 930 business systems in accordance with the requirements of the act. In fiscal year 2007, it is to review all tiers 1 through 4 business systems, as well as tier 5 business

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<sup>68</sup> Approval authorities (the USD(AT&L); the Under Secretary of Defense (Comptroller); the Under Secretary of Defense for Personnel and Readiness; the ASD(NII)/CIO; and the Deputy Secretary of Defense or an Under Secretary of Defense, as designated by the Secretary of Defense) are responsible for the review, approval, and oversight of business systems and must establish investment review processes for systems under their cognizance.

<sup>69</sup> A key condition identified in the act includes certification by designated approval authorities that the defense business system modernization is (1) in compliance with the enterprise architecture; (2) necessary to achieve critical national security capability or address a critical requirement in an area such as safety or security; or (3) necessary to prevent a significant adverse effect on a project that is needed to achieve an essential capability, taking into consideration the alternative solutions for preventing such an adverse effect.

<sup>70</sup> 31 U.S.C. § 1341(a)(1)(A); see 10 U.S.C. § 2222(b).

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systems<sup>71</sup> that have operating costs, not simply development and modernization funding, greater than \$1 million. During fiscal year 2008, the Air Force plans to review all business systems in tiers 1 through 4 and all tier 5 systems that have operating costs greater than \$500,000. For fiscal year 2009, all business systems are to be reviewed. According to Air Force officials, implementing a phased approach allows time to adopt the investment management guidance set forth in our ITIM framework.<sup>72</sup> While not specifically required by the act, Air Force officials told us that the investment management practices that it intends to put in place for its business systems will also be leveraged for non-business system investments (e.g., warfighting systems). We currently have ongoing work to review the extent to which the Air Force's business systems investment structures and processes comport with our ITIM framework.

Army

Army officials report that their department's primary emphasis has been on reviewing its business system investments with funding in excess of \$1 million (i.e., tiers 1 through 3 business systems). However, officials told us that they intend to develop a list of all business systems that require annual reviews through January 2008 to guide future efforts. Currently, the Army reports an inventory of 873 business systems, of which 108 are systems with development/modernization funding in excess of \$1 million, and another 765 business system investments with funding below \$1 million, including 62 with no development/modernization funding.

Navy

Navy officials report that their department is in the process of conducting reviews of its 697 business systems in accordance with the requirements of the act, although the processes being used are still evolving. For example, Navy officials stated that the focus of the reviews has thus far been on those systems with development/modernization funding over \$1 million. According to DOD, for fiscal years 2006 and 2007, 54 business systems were certified by the IRBs and approved by the DBSMC. Further, they said that greater coordination with DOD functional areas (e.g., logistics) and ASD(NII)/CIO is needed to improve the control and accountability over its business system investments. We currently have ongoing work to review the extent to which the Navy's business systems investment structures and processes comport with our ITIM framework.

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<sup>71</sup>According to Air Force officials, tier 5 systems only spend current service funds.

<sup>72</sup>[GAO-04-394G](#).

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## DOD Continues to Implement Our Prior Recommendations

The act's requirements concerning the architecture, transition plan, budgetary disclosure, and investment management structures and processes—as discussed earlier—are consistent with the 35 recommendations that we have made since 2001, to assist the department in developing a well-defined and useful BEA and using it to gain control over its ongoing business system investments. To its credit, DOD largely agreed with these recommendations and stated its commitment to implement them. In May 2006, we reported that the department had taken steps to fully implement 21 of the recommendations, while 14 had yet to be fully implemented.<sup>73</sup>

Since then, 10 of the 14 have either been largely implemented or have been subsumed by our more recent recommendations and thus we are considering them closed. (See app. II for details on the status of these 14 recommendations; see app. III for a detailed listing of the additional recommendations that we have made since our last annual report under the act.) For example, DOD has addressed the core elements in our Enterprise Architecture Management Maturity Framework<sup>74</sup> relative to its corporate BEA. In particular, it has established a chief architect who is responsible for developing the corporate BEA and ensuring that the BEA depicts the “As Is” and “To Be” environments in terms of business, performance, information/data, application/service, technology, and security. As another example, the department has taken steps to make effective use of the results of its BEA independent verification and validation contractor on prior versions of the architecture. As we have previously reported, using an independent verification and validation agent is a recognized best practice because it provides internal and external oversight bodies important information on architecture and transition plan quality and governance. By having and using an independent verification and validation agent, organizations can disclose to oversight bodies independent assessments of architecture and transition plan quality, to include completeness, consistency, understandability, and usability, which the department has yet to provide in its annual reports.

With respect to the remaining 4 of the 14 recommendations, actions are under way that are intended to implement them. For example, in response

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<sup>73</sup> GAO-06-658.

<sup>74</sup> GAO-03-584G.

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to our recommendation to develop a BEA program management plan<sup>75</sup> that defines what the department's incremental improvements to the architecture and transition plan will be, and how and when they will be accomplished, the BTA has developed the Business Transformation Guidance, which describes the high-level process by which incremental improvements are identified and eventually incorporated into the architecture. In addition, BTA officials stated that they are developing a BEA Concept of Operations, which is to describe high-level milestones for the BEA's use.

As another example, the BTA has established a communications team that is responsible for achieving strategic communications objectives and promoting external awareness of the department's vision, mission, and progress, and BTA officials told us that this team is in the process of developing a communications plan. According to the officials, these efforts will address our recommendation for the BEA program to be supported by a proactive marketing and communication program.<sup>76</sup>

According to the Deputy Under Secretary of Defense (Business Transformation), the department is committed to addressing all of our open recommendations. It is important that the department move swiftly in doing so because these recommendations are aimed at strengthening architecture (and transition planning) management activities and controlling ongoing and planned business system investments. Until it does, the department will be challenged in its ability to effectively guide and constrain the billions of dollars it invests annually in thousands of business system investments.

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## Conclusions

Since our last legislatively mandated report on DOD's compliance with section 332 of the National Defense Authorization Act for Fiscal Year 2005, DOD has continued to make important progress in defining and implementing institutional modernization management controls and business systems budgetary disclosure, but much remains to be accomplished. In particular, the department has yet to extend and evolve its corporate BEA through the development of aligned subordinate architectures for each of its component organizations, and while it has developed a strategy for federating the BEA in this manner, this strategy

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<sup>75</sup> GAO-06-658.

<sup>76</sup> GAO-03-458.

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lacks the detail needed for it to be effectively implemented. Compounding this situation is the known immaturity of the military service architecture efforts, as well as DOD's corporate approach to business system investment management not being governed by the range of defined policies and procedures that are associated with effective investment selection, control, and evaluation. Moreover, the military departments' investment review processes are still evolving. These architecture and investment management limitations continue to put the billions of dollars that DOD spends each year on its thousands of business system investments at risk.

The recommendations that we have made since we issued our last annual report under the act are aimed at addressing these architecture and investment management challenges. Given the demonstrated commitment of DOD leadership to improving its business systems modernization efforts and its recent responsiveness to our prior recommendations, we are optimistic concerning the likelihood that the department will continue to make progress on these fronts.

Development of a well-defined federated architecture for the business mission area and the definition of effective business system investment management policies and procedures across all levels of the department are critically important in addressing the DOD business system modernization high-risk area. However, the more formidable challenge facing the department is how well it actually implements the architecture and investment management controls over the years ahead on each and every business system investment. While not a guarantee, development of a federated BEA, including a transition plan(s), and effective institutional business system investment management processes can go a long way in addressing this longer-term challenge. In this regard, it is important for the department to keep congressional defense committees fully informed about its progress in federating the DOD corporate BEA, to include the maturity of component organization architecture efforts and the related transition plan(s).

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## Recommendation for Executive Action

To facilitate congressional oversight and promote departmental accountability, we recommend that the Secretary of Defense direct the Deputy Secretary of Defense, as the chair of the DBSMC, to include in DOD's annual report to Congress on compliance with the section 332 of Fiscal Year 2005 National Defense Authorization Act, the results of assessments by its BEA independent verification and validation contractor of the completeness, consistency, understandability, and usability of its

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federated family business mission area architectures, including the associated transition plan(s).

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## Agency Comments

In written comments on a draft of this report, signed by the Deputy Under Secretary of Defense (Business Transformation) and reprinted in appendix IV, the department agreed with our recommendation.

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We are sending copies of this report to interested congressional committees; the Director, Office of Management and Budget; the Secretary of Defense; the Deputy Secretary of Defense; the Under Secretary of Defense for Acquisition, Technology, and Logistics; the Under Secretary of Defense (Comptroller); the Assistant Secretary of Defense (Networks and Information Integration)/Chief Information Officer; the Under Secretary of Defense (Personnel and Readiness); and the Director, Defense Finance and Accounting Service. Copies of this report will be made available to other interested parties upon request. This report will also be available at no charge on our Web site at <http://www.gao.gov>.

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If you or your staffs have any questions on matters discussed in this report, please contact me at (202) 512-3439 or [hiter@gao.gov](mailto:hiter@gao.gov), or McCoy Williams at (202) 512-9095 or [williamsm1@gao.gov](mailto:williamsm1@gao.gov). Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made major contributions to this report are listed in appendix V.



Randolph C. Hite  
Director  
Information Technology Architecture and Systems Issues



McCoy Williams  
Director  
Financial Management Assurance

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*List of Committees*

The Honorable Carl Levin  
Chairman  
The Honorable John McCain  
Ranking Member  
Committee on Armed Services  
United States Senate

The Honorable Daniel Inouye  
Chairman  
The Honorable Ted Stevens  
Ranking Member  
Committee on Appropriations  
United States Senate

The Honorable Ike Skelton  
Chairman  
The Honorable Duncan Hunter  
Ranking Member  
Committee on Armed Services  
House of Representatives

The Honorable John P. Murtha  
Chairman  
The Honorable C.W. Bill Young  
Ranking Member  
Committee on Appropriations  
House of Representatives

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# Appendix I: Objectives, Scope, and Methodology

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Our objectives were to (1) assess the actions by the Department of Defense (DOD) to comply with the requirements of section 2222 of Title 10, U.S. Code,<sup>1</sup> and (2) determine the extent to which DOD has addressed our prior open recommendations for institutionalizing key business system modernization management controls.

For our first objective, we focused on five of the six requirements in section 2222, and related best practices contained in federal guidance, that we identified in our last annual report under the act as not being fully satisfied.<sup>2</sup> Generally, these five requirements are (1) development of a business enterprise architecture (BEA), (2) development of a transition plan for implementing the BEA, (3) inclusion of business systems information in DOD's budget submission, (4) establishment of business systems investment review processes and structures, and (5) approval of defense business systems investments with obligations in excess of \$1 million. (See the Background section of this report for additional information on the act's requirements.) We did not include the sixth requirement because our last annual report under the act shows that it had been satisfied. Our methodology relative to each of the five requirements is as follows.

- To determine whether the BEA addressed the requirements specified in the act, and related guidance, we analyzed version 4.1 of the BEA, which was released on March 15, 2007, relative to the act's specific architectural requirements and related guidance that our last annual report under the act identified as not being met. We also reviewed version 4.1 to confirm whether statements made in DOD's March 15, 2007, annual report about the BEA's content were accurate. Also, we reviewed and leveraged the applicable results contained in our recent reports on major departments' and agencies' enterprise architecture programs and on DOD's BEA federation strategy.<sup>3</sup>

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<sup>1</sup>Ronald W. Reagan National Defense Authorization Act for Fiscal Year 2005, Pub. L. 108-375, § 332, 118 Stat. 1811, 1851-1856 (Oct. 28, 2004) (codified in part at 10 U.S.C. § 2222).

<sup>2</sup>GAO, *Business Systems Modernization: DOD Continues to Improve Institutional Approach, but Further Steps Needed*, GAO-06-658 (Washington, D.C.: May 15, 2006).

<sup>3</sup>GAO, *Business Systems Modernization: Strategy for Evolving DOD's Business Enterprise Architecture Offers Conceptual Approach, but Execution Details Needed*, GAO-07-451 (Washington, D.C.: Apr. 16, 2007); and *Enterprise Architecture: Leadership Remains Key to Establishing and Leveraging Architectures for Organizational Transformation*, GAO-06-831 (Washington, D.C.: Aug. 14, 2006).

- To determine whether the enterprise transition plan (ETP) addressed the requirements specified in the act, we reviewed the updated version of the ETP, which was released on March 15, 2007, relative to the act's specific transition plan requirements and related guidance that our last annual report under the act identified as not being met. We also reviewed the ETP to confirm that statements in DOD's March 15, 2007, annual report about the content of the ETP were accurate.
- To determine whether DOD's fiscal year 2008 information technology budget submission was prepared in accordance with the criteria set forth in the act, we reviewed and analyzed the department report entitled Report on Defense Business System Modernization FY 2005 National Defense Authorization Act, Section 332, prepared in February 2007 and compared the information obtained to the specific requirements in the act.
- To determine whether DOD has established investment review structures and processes, we focused the act's requirements that our last annual report under the act identified as not being met, obtaining documentation and interviewing cognizant DOD officials about efforts to establish the one Investment Review Board (IRB) specified in the act that had yet to be established. We also reviewed and leveraged our recent report that assessed DOD's corporate investment approach to managing business system investments against relevant federal guidance.<sup>4</sup>
- To determine whether the department was reviewing and approving business system investments exceeding \$1 million, we obtained the list of business system investments certified by the IRBs and approved by the Defense Business Systems Management Committee from the Business Transformation Agency (BTA). We then compared the detailed information provided with the summary information contained in the department's March 15, 2007, report to the congressional defense committees to identify any anomalies. We also met with representatives from the Air Force, the Army, and the Navy to ascertain the specific actions that were taken (or planned to be taken) in order to perform the annual systems reviews as required by the act.

To determine the extent to which DOD has addressed our prior open recommendations, we focused on the 14 recommendations that we identified in our last annual report under the act as not being

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<sup>4</sup>GAO, *Business Systems Modernization: DOD Needs to Fully Define Policies and Procedures for Institutionally Managing Investments*, GAO-07-538 (Washington, D.C.: May 11, 2007).

implemented. We did not examine the recommendations for establishing and implementing key business system modernization management controls that we made since this last annual report because sufficient time had yet to elapse for the department to have addressed them. (See app. III for a list of the recommendations made since our last annual report under the act.) In reviewing the 14 recommendations, we obtained and analyzed documentation relative to corrective actions taken and planned.

Documentation that we reviewed included the DOD's March 15, 2007, annual report, updated transition plan, and BEA version 4.1. We also compared a range of other program documentation, such as program policies and procedures and configuration plan, to relevant elements in our Enterprise Architecture Management Maturity Framework.<sup>5</sup> Further, we reviewed documentation regarding DOD verification and validation contractor activities and the BTA's human capital strategy. In addition, we reviewed the guidance establishing the IRBs and describing the investment review, certification, and approval process.

We did not independently validate the reliability of the cost and budget figures provided by DOD because the specific amounts were not relevant to our findings. We conducted our work at DOD headquarters in Arlington, Virginia, from March through May 2007 in accordance with generally accepted government auditing standards.

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<sup>5</sup>GAO, *Information Technology: A Framework for Assessing and Improving Enterprise Architecture Management (Version 1.1)*, GAO-03-584G (Washington, D.C.: April 2003).

# Appendix II: Status of Prior Recommendations Identified as Open in GAO's Prior Annual Report under the Act

GAO report information and recommendation	Implemented/ Closed		GAO assessment
	Yes	In process	
<b>GAO-01-525: Information Technology: Architecture Needed to Guide Modernization of DOD's Financial Operations, May 17, 2001.</b>			
(1) Until an enterprise architecture is developed and the Council is positioned to serve as Department of Defense's (DOD) financial management investment review board as recommended, the Secretary of Defense limit DOD components' financial management investments to the deployment of systems that have already been fully tested and involve no additional development or acquisition costs; stay-in-business maintenance needed to keep existing systems operational; management controls needed to effectively invest in modernized systems; and new systems or existing system changes that are congressionally directed or are relatively small, cost-effective, and low risk and can be delivered in a relatively short time frame.	X		This recommendation has been subsumed by more recent recommendations concerning the department's efforts to federate the corporate business enterprise architecture (BEA), mature DOD component organization architectures, and establish policies and procedures for effective corporate business system investment management. (See app. III for these more recent recommendations.)
<b>GAO-03-458: DOD Business Systems Modernization: Improvements to Enterprise Architecture Development and Implementation Efforts Needed, February 28, 2003.</b>			
(1) The Secretary of Defense ensure that the enterprise architecture program is supported by a proactive marketing and communication program.	X		The Business Transformation Agency (BTA) has established a communications team that is responsible for achieving strategic communications objectives and promoting external awareness of the department's vision, mission, and progress. However, the department has yet to develop a communication plan that adheres to criteria set forth by the best practices, to include an explanation of roles and responsibilities and details regarding evaluation, metrics, and feedback. BTA officials told us that such a plan is currently in development.

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**Appendix II: Status of Prior  
Recommendations Identified as Open in  
GAO's Prior Annual Report under the Act**

<b>GAO report information and recommendation</b>	<b>Implemented/ Closed</b>		<b>GAO assessment</b>
	<b>Yes</b>	<b>In process</b>	
<b>GAO-03-1018: DOD Business Systems <i>Modernization: Important Progress Made to Develop Business Enterprise Architecture, but Much Work Remains</i>, September 19, 2003.</b>			
(1) The Secretary of Defense or his appropriate designee implement the core elements in our Enterprise Architecture Framework for Assessing and Improving Enterprise Architecture Management that we identify in this report as not satisfied, including ensuring that minutes of the meetings of the executive body charged with directing, overseeing, and approving the architecture are prepared and maintained.	X		The BTA has largely addressed the 31 core elements in our Enterprise Architecture Management Maturity Framework in its corporate BEA, which is the intended focus of the recommendation. For example, the BTA has established a chief architect who is responsible for developing and maintaining the corporate BEA and the version 4.1 of the BEA largely provides a depiction of both the "As Is" and "To Be" environments in terms of business, performance, information/data, application/service, technology, and security. (See app. III for recent recommendations aimed at having the military departments address these core elements.)
(2) The Secretary of Defense or his appropriate designee update version 1.0 of the architecture to include the 29 key elements governing the "As Is" architectural content that our report identified as not being fully satisfied.	X		The BTA has largely addressed these 29 key elements relative to its corporate BEA, which is the intended focus of the recommendation. For example, version 4.1 of the BEA contains enterprise-level "As Is" information to support business capability gap analyses. In addition, the architecture includes "As Is" information for five of the six business enterprise priorities and "As Is" information for enterprise systems, such as the Wide-area Workflow system. (See app. III for recent recommendations aimed at effectively federating the corporate BEA to DOD component organizations.)
(3) The Secretary of Defense or his appropriate designee update version 1.0 of the architecture to include the 30 key elements governing the "To Be" architectural content that our report identified as not being fully satisfied.	X		The BTA has largely addressed these 30 key elements relative to its corporate BEA, which is the intended focus of the recommendation. For example, version 4.1 of the BEA identifies activities performed at each location/organization and indicates which organization(s) is or will be involved in each activity. Furthermore, it includes common business rules (e.g., "each request for commercial export of DOD technology must be processed within 30 days upon receipt of request from the Department of State or the Department of Commerce") to facilitate consistent implementation of the architecture. (See app. III for recent recommendations aimed at effectively federating the corporate BEA to DOD component organizations.)

**Appendix II: Status of Prior  
Recommendations Identified as Open in  
GAO's Prior Annual Report under the Act**

<b>GAO report information and recommendation</b>	<b>Implemented/ Closed</b>		<b>GAO assessment</b>
	<b>Yes</b>	<b>In process</b>	
(4) The Secretary of Defense or his appropriate designee update version 1.0 of the architecture to include (a) the 3 key elements governing the transition plan content that our report identified as not being fully satisfied and (b) those system investments that will not become part of the "To Be" architecture, including time frames for phasing out those systems.	X		The BTA has largely addressed this recommendation for its corporate or enterprise transition plan, which is the intended focus of the recommendation. For example, the latest version of the transition plan now documents how BEA elements (e.g., specific business capability improvements) provide solutions to significant DOD issues or business capability gaps (e.g., mission needs, materiel weaknesses). It also provides performance information of DOD transformation at both the enterprise level and component level, including performance metrics and milestones. (See app. III for recent recommendations aimed at effectively federating the corporate BEA, to include the transition plan, to DOD component organizations.)
(5) The Secretary of Defense or his appropriate designee update version 1.0 of the architecture to address comments made by the verification and validation contractor.	X		The verification and validation contractor reports that all of these comments on versions 3.0 and prior versions have been addressed.
(6) The Secretary of Defense or his appropriate designee develop a well-defined, near-term plan for extending and evolving the architecture and ensure that this plan includes addressing our recommendations, defining roles and responsibilities of all stakeholders involved in extending and evolving the architecture, explaining dependencies among planned activities, and defining measures of activity progress.	X		This recommendation has been subsumed by a later recommendation in <a href="#">GAO-06-658</a> .
(7) The Secretary of Defense or his appropriate designee limit the pilot projects to small, low-cost, low-risk prototype investments that are intended to provide knowledge needed to extend and evolve the architecture, and are not to acquire and implement production version system solutions or to deploy an operational system capability.	X		According to BTA officials, the department is continuing to assess and clarify the role of pilot projects and a policy is to be developed relative to them. However, they did not provide specific plans and time frames for developing and implementing this policy.
<b>GAO-05-381: DOD Business Systems Modernization: Billions Being Invested without Adequate Oversight, April 29, 2005.</b>			
(1) The Secretary of Defense direct that the DBSMC develop a comprehensive plan that addresses implementation of our previous recommendations related to the BEA and the control and accountability over business systems investments (at a minimum, the plan should assign responsibility and estimated time frames for completion).	X		DOD's March 15, 2007, annual report to the congressional defense committees identifies specific actions the department is taking to address our open recommendations. The March report noted that BTA has overall responsibility for ensuring that remaining open recommendations are adequately addressed.

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**Appendix II: Status of Prior  
Recommendations Identified as Open in  
GAO's Prior Annual Report under the Act**

<b>GAO report information and recommendation</b>	<b>Implemented/ Closed</b>		<b>GAO assessment</b>
	<b>Yes</b>	<b>In process</b>	
(2) The Secretary of Defense direct that the comprehensive plan we recommend be incorporated into the department's second annual report due March 15, 2006, to the defense congressional committees, as required by the Fiscal Year 2005 Defense Authorization act to help facilitate congressional oversight.	X		DOD's March 15, 2006, and March 15, 2007, reports to congressional committees included steps that DOD is taking or plans to take to address our open recommendations.
<b>GAO-05-702: DOD Business Systems Modernization: Long-standing Weaknesses in Enterprise Architecture Development Need to Be Addressed, July 22, 2005.</b>			
(1) The Secretary of Defense should direct the Deputy Secretary of Defense, as the chair of the DBSMC and in collaboration with DBSMC members, to ensure that each of our recommendations related to the BEA management and content are reflected in the plans and commitments.	X		BTA and BEA program documentation reflects activities and steps taken or planned to address our recommendations relative to BEA content and management. Furthermore, the department has stated its commitment to doing so in its annual reports to the congressional defense committees.
(2) The Secretary of Defense should direct the Deputy Secretary of Defense, as the chair of the DBSMC and in collaboration with DBSMC members, to ensure that plans and commitments provide for effective BEA workforce planning, including assessing workforce knowledge and skills needs, determining existing workforce capabilities, identifying gaps, and filling these gaps.	X		On March 21, 2007, the BTA released its Human Capital Strategic Plan 2007-2009, which identifies BTA's goals for human capital development and workforce planning. This strategy provides an overview of the current workforce status in relation to those goals and identifies several key activities for how to proceed in order to achieve the goals. In addition, the strategy includes an initial implementation roadmap with timelines for key activities. According to BTA officials, the detailed plans for accomplishing key activities will be contained in BTA's Human Capital Implementation Plan, which has yet to be released.

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**Appendix II: Status of Prior  
Recommendations Identified as Open in  
GAO's Prior Annual Report under the Act**

GAO report information and recommendation	Implemented/ Closed		GAO assessment
	Yes	In process	
<p><b>GAO-06-658: Business Systems</b> <i>Modernization: DOD Continues to Improve Institutional Approach, but Further Steps Needed, May 15, 2006.</i></p> <p>(1) The Secretary of Defense direct the Deputy Secretary of Defense, as the chair of the DBSMC, to submit an enterprise architecture program management plan to defense congressional committees that defines what the department's incremental improvements to the architecture and transition plan will be, and how and when they will be accomplished, including what (and when) architecture and transition plan scope and content and architecture compliance criteria will be added into which versions; the plan should also include an explicit purpose and scope for each version of the architecture, along with milestones, resource needs, and performance measures for each planned version.</p>	X		BTA has developed several documents that are intended to begin addressing this recommendation. For example, it has developed the Business Transformation Guidance, which describes the high-level process by which incremental improvements are identified and eventually incorporated into the BEA. In addition, BTA officials told us that they are developing a BEA Concept of Operations, which is to describe high-level milestones required to address the architecture's use (e.g., investment management, strategic decision making, oversight, system implementation, and business case development). Notwithstanding these steps, the department has yet to develop an architecture program management plan that we have recommended. (See app. III for a more recent recommendation that augments this recommendation.)

Source: GAO.

Note: See GAO, *Business Systems Modernization: DOD Continues to Improve Institutional Approach, but Further Steps Needed*, GAO-06-658 (Washington, D.C.: May 15, 2006).

# Appendix III: Other Open Recommendations on Business Architectures, Federation Strategy, and Investment Management

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## GAO report information and recommendation

**GAO-06-831: Enterprise Architecture: Leadership Remains Key to Establishing and Leveraging Architectures for Organizational Transformation, August 14, 2006.**

1. The Secretary of Defense ensure that the Department of Defense (DOD) - Global Information Grid enterprise architecture program develops and implements plans for fully satisfying each of the conditions in our enterprise architecture management maturity framework.
2. The Secretary of Defense ensure that the Department of the Air Force enterprise architecture program develops and implements plans for fully satisfying each of the conditions in our enterprise architecture management maturity framework.
3. The Secretary of Defense ensure that the Department of the Army enterprise architecture program develops and implements plans for fully satisfying each of the conditions in our enterprise architecture management maturity framework.
4. The Secretary of Defense ensure that the Department of the Navy enterprise architecture program develops and implements plans for fully satisfying each of the conditions in our enterprise architecture management maturity framework.

**GAO-07-451: Business Systems Modernization: Strategy for Evolving DOD's Business Enterprise Architecture Offers a Conceptual Approach, but Execution Details Are Needed, April 16, 2007.**

1. The Secretary of Defense direct the Deputy Secretary of Defense, as the chair of the Defense Business Systems Management Committee (DBSMC), to ensure that the appropriate DOD organizations submit a business enterprise architecture (BEA) development management plan that describes, at a minimum, how the business mission area architecture federation will be governed; how the business mission area federation strategy alignment with the DOD enterprise architecture federation strategy will be achieved; how component business architectures' alignment with incremental versions of the BEA will be achieved; how shared services will be identified, exposed, and subscribed to; and what milestones will be used to measure progress and results.

**GAO-07-538: Business Systems Modernization: DOD Needs to Fully Define Policies and Procedures for Institutionally Managing Investments, May 11, 2007.**

1. The Secretary of Defense should direct the Deputy Secretary of Defense, as the chair of the DBSMC, to ensure that well-defined and disciplined business system investment management policies and procedures are developed and issued. At a minimum, this should include project-level management policies and procedures that address the following five areas:
  - instituting the investment boards, including assigning the investment boards responsibility, authority, and accountability for programs throughout the investment life cycle and specifying how the business investment management system is coordinated with the Joint Capabilities Integration and Development System, the Planning, Programming, Budgeting, and Execution system, and the Defense Acquisition System;
  - selecting new investments, including specifying how cost, schedule, and benefit data are to be used in making certification decisions; defining the criteria used to select investments as enterprise-wide; and establishing consistent and effective guidance for BEA compliance;
  - reselecting ongoing investments, including specifying how cost, schedule, and performance data are to be used in the annual review process and providing for the reselection of investments that are in operations and maintenance;
  - integrating funding with the process of selecting an investment, including specifying how the DBSMC and the investment review boards use funding information in carrying out decisions on system certification and approvals; and
  - overseeing IT projects and systems, including providing sufficient oversight and visibility into component-level investment management activities.

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**Appendix III: Other Open Recommendations  
on Business Architectures, Federation  
Strategy, and Investment Management**

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**GAO report information and recommendation**

2. The Secretary of Defense should direct the Deputy Secretary of Defense, as the chair of the DBSMC, to ensure that well-defined and disciplined business system investment management policies and procedures are developed and issued. These policies and procedures should also include portfolio-level management policies and procedures that address the following four areas:
  - creating and modifying information technology portfolio selection criteria for business system investments;
  - analyzing, selecting, and maintaining business system investment portfolios;
  - reviewing, evaluating, and improving the performance of its portfolio(s) by using project indicators such as cost, schedule, and risk; and
  - conducting postimplementation reviews for all investment tiers and directing the investment boards who are accountable for corporate business system investments, to consider the information gathered and to develop lessons learned from these reviews.

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Source: GAO.

# Appendix IV: Comments from the Department of Defense

  
**OFFICE OF THE UNDER SECRETARY OF DEFENSE**  
3000 DEFENSE PENTAGON  
WASHINGTON, DC 20301-3000

ACQUISITION,  
TECHNOLOGY  
AND LOGISTICS

MAY 4 2007

Mr. Randy Hite  
Director, Information Technology Architecture and Systems Issues

Mr. McCoy Williams  
Director, Financial Management Assurance

U.S. Government Accountability Office  
441 G Street NW  
Washington, DC 20548

Dear Messieurs Hite and Williams:

This is the Department of Defense (DoD) response to the GAO Draft Report, GAO-07-733 "DOD BUSINESS SYSTEMS MODERNIZATION: Progress Continues to be Made in Establishing Corporate Management Controls, but Further Steps Are Needed," dated April 26, 2007 (GAO Code 310643).

Enclosed please find the Department's response to GAO's draft report. DoD concurs with GAO's recommendation.

We continue to view GAO's insight as a valuable asset to the Department's defense business transformation efforts. We welcome GAO's participation in our future efforts as the Department continues to progress.

*Elizabeth A. Brinkley, Jr.*  
Paul A. Brinkley  
Deputy Under Secretary of Defense  
(Business Transformation)

Enclosure:  
As stated



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**Appendix IV: Comments from the Department  
of Defense**

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GAO DRAFT REPORT DATED APRIL 26, 2007  
GAO-07-733 (GAO CODES 310643)

"DOD BUSINESS SYSTEMS MODERNIZATION: PROGRESS CONTINUES TO BE  
MADE IN ESTABLISHING CORPORATE MANAGEMENT CONTROLS, BUT  
FURTHER STEPS ARE NEEDED"

DEPARTMENT OF DEFENSE COMMENTS  
TO THE GAO RECOMMENDATION

**RECOMMENDATION 1:** The GAO recommended that the Secretary of Defense direct the Deputy Secretary of Defense, as the chair of the Defense Business Systems Management Committee, to include in DoD's annual report to the Congress on compliance with the Fiscal Year 2005 National Defense Authorization Act, the results of assessments by its Business Enterprise Architecture independent verification and validation contractor of the completeness, consistency, understandability, and usability of its federated family of business mission area architectures, including the associated transition plan(s).  
(p. 50/GAO Draft Report)

**DOD RESPONSE: Concur** – The DoD concurs with the recommendation that the results of these types of assessments be included in DoD's annual report to the Congress on compliance with the Fiscal Year 2005 National Defense Authorization Act.

Attachment

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# Appendix V: GAO Contacts and Staff Acknowledgments

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## GAO Contacts

Randolph C. Hite (202) 512-3439 or [hiter@gao.gov](mailto:hiter@gao.gov)  
McCoy Williams (202) 512-9095 or [williamsml@gao.gov](mailto:williamsml@gao.gov)

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## Staff Acknowledgments

In addition to the contact persons named above, key contributors to this report were Beatrice Alff, Karl Essig, Nancy Glover, Michael Holland, Neelaxi Lakhmani (Assistant Director), Anh Le, Evelyn Logue, Jacqueline Mai, John Martin, Darby Smith (Assistant Director), Debra Rucker, and Jennifer Stavros-Turner.

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